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L6 3811 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)P(L)O(L)(TI OR V
OR CR OR MN OR FE OR CO OR NI OR CU OR ZR OR NB OR MO OR
RU OR AG OR TA OR W OR PT OR AU)/ELS
L7 1802 SEA FILE=REGISTRY ABB=ON PLU=ON L6 NOT 04P
L10 291 SEA FILE=REGISTRY ABB=ON PLU=ON L7 AND TIS/CI
L11 165 SEA FILE=HCAPLUS ABB=ON PLU=ON L10
L12 54 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 AND ?ELECTROLYT?
L13 53 SEA FILE=REGISTRY ABB=ON PLU=ON L10 AND 2-7/LI
L14 46 SEA FILE=REGISTRY ABB=ON PLU=ON L13 AND 3.5-8/O
L15 46 SEA FILE=REGISTRY ABB=ON PLU=ON L14 AND 0.01-1/M
L16 245 SEA FILE=REGISTRY ABB=ON PLU=ON L10 NOT L15
L17 153 SEA FILE=HCAPLUS ABB=ON PLU=ON L16
L18 49 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 AND ?ELECTROLYT?
L19 54 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 OR L18
L20 40 SEA FILE=HCAPLUS ABB=ON PLU=ON L19 AND (1840-2003)/PRY,AY
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L20 ANSWER 1 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:675612 HCAPLUS Full-text
DOCUMENT NUMBER: 147:98643
TITLE: Electrodes comprising mixed active particles
INVENTOR(S): Barker, Jeremy
PATENT ASSIGNEE(S): UK
SOURCE: U.S. Pat. Appl. Publ., 37pp., Cont.-in-part of
U.S. Ser. No. 381,602.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|---|----------|-----------------------|-------------|
| US 20070141468 | A1 | 20070621 | US 2007-676707 <-- | 20070220 |
| US 20040197654 | A1 | 20041007 | US 2003-406890 <-- | 20030403 |
| US 7041239 | B2 | 20060509 | | |
| US 20060194112 | A1 | 20060831 | US 2006-381602 <-- | 20060504 |
| WO 2008103666 | A2 | 20080828 | WO 2008-US54292 | 20080219 |
| W: | AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW | | | |
| RW: | AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM | | | |
| PRIORITY APPLN. INFO.: | | | US 2003-406890 | A1 20030403 |

<--

US 2006-381602

A2 20060504

US 2007-676707

A 20070220

ED Entered STN: 22 Jun 2007

AB Disclosed is a battery containing a first electrode and a second electrode, and an electrolyte for transferring ionic charge-carriers there between, wherein the first electrode contains a first electrode active material represented by the formula A₂eM₄kM₅mM₆nM₇oO_g, and at least one second electrode active material selected from the group consisting of active materials represented by the formula Al_aM_b(XY₄)_cZ_d, active materials represented by the formula A₃Mn_iO₄, and mixts. thereof.

IT 610321-60-3P

(electrodes comprising mixed active particles)

RN 610321-60-3 HCPLUS

CN Aluminum cobalt iron lithium magnesium fluoride metaphosphate oxide (Al₁₀.02Co₀.8Fe₀.1LiMg₀.05F₀.02(PO₃)₀.98) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 0.98 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| F | 0.02 | 14762-94-8 |
| Co | 0.8 | 7440-48-4 |
| Mg | 0.05 | 7439-95-4 |
| Li | 1 | 7439-93-2 |
| Fe | 0.1 | 7439-89-6 |
| Al | 0.02 | 7429-90-5 |

INCL 429231100; 429224000; 429231300

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

IT 12162-92-4P, Lithium vanadium oxide (Li₂V₂O₅) 12190-79-3P, Cobalt lithium oxide (CoLiO₂) 12527-46-7P, Copper lithium oxide (CuLi₂O₂) 84159-18-2P, Lithium vanadium phosphate Li₃V₂(PO₄)₃ 143623-49-8P, Cobalt lithium nickel oxide (Co_{0.25}LiNi_{0.75}) 179802-96-1P, Cobalt lithium manganese nickel oxide (Co_{0.2}LiMn_{0.1}Ni_{0.7}) 610321-60-3P 632286-77-2P, Iron lithium magnesium phosphate Fe_{0.9}LiMg_{0.1}PO₄ 643752-34-5P, Iron lithium magnesium phosphate (Fe_{0.95}LiMg_{0.05}(PO₄) 942263-50-5P 942263-51-6P

(electrodes comprising mixed active particles)

L20 ANSWER 2 OF 40 HCPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 2005:545195 HCPLUS Full-text

DOCUMENT NUMBER: 143:81020

TITLE: Lithium battery showing both high electric potential and lithium intercalation capacity.

INVENTOR(S): Jouanneau-Si Larbi, Severine; Le Cras, Frederic; Bourbon, Carole; Gauthier, Gilles

PATENT ASSIGNEE(S): Commissariat a l'Energie Atomique, Fr.

SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|------|-----------------|------|
|------------|------|------|-----------------|------|

| | | | | |
|---|----|----------|------------------|------------|
| EP 1544930 | A2 | 20050622 | EP 2004-354039 | 20041202 |
| | | | <-- | |
| EP 1544930 | A3 | 20070725 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU | | | | |
| FR 2864348 | A1 | 20050624 | FR 2003-14865 | 20031218 |
| | | | <-- | |
| FR 2864348 | B1 | 20060310 | | |
| US 20050136331 | A1 | 20050623 | US 2004-998985 | 20041130 |
| | | | <-- | |
| JP 2005183395 | A | 20050707 | JP 2004-368132 | 20041220 |
| | | | <-- | |
| CN 1641915 | A | 20050720 | CN 2004-10102151 | 20041220 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | FR 2003-14865 | A 20031218 |
| | | | <-- | |

ED Entered STN: 24 Jun 2005

AB A lithium battery consists of at least one first electrode consisting of active material into which the Li⁺ cations are able to be inserted, a second electrode, and an electrolyte. The active material in the first electrode consists of a condensed linear composition possessing at least two tetrahedra, resp. of type A04 and A'04, linked by one common oxygen. An ion M²⁺ of a transition metal of oxidation state +2 and chosen from between Ni²⁺, Co²⁺, Mn²⁺, Fe²⁺, and Ti²⁺ is inserted into the condensed linear composition and the ratio between the number of Li⁺ cations which can be inserted into the active material and the number of transition metal M²⁺ ions is strictly greater than 1. A and A' are chosen from between P⁵⁺, Si⁴⁺, Al³⁺, S⁶⁺, Ge⁴⁺, and B³⁺. One possible active material is Li_aX_bM_Zd(A207)e(A'03)f, where X represents at least one alkali metal at an oxidation state of 1+ chosen from among Li⁺, Na⁺, K⁺, and M represents at least one transition metal of oxidation state 2+ chosen from among Ni²⁺, Co²⁺, Mn²⁺, Fe²⁺, and Ti²⁺, and Z represents at least one transition metal chosen from the group Cu⁺, Ag⁺, Mg²⁺, Ca²⁺, Sr²⁺, Zn²⁺, V²⁺, Cu²⁺, Al³⁺, Ti³⁺, Cr³⁺, Fe³⁺, Mn³⁺, Ga³⁺, V³⁺, Ge³⁺, Sn³⁺, Mo³⁺, Ti⁴⁺, V⁴⁺, V⁵⁺, Ta⁵⁺, Nb⁵⁺ and Mo⁶⁺, the chemical elements O, S, F, and Cl, and a grouping of type A'04, and a1>1 and b>1 and d>0, and at least e or f>0. A'' is a cation chosen from P⁵⁺, Si⁴⁺, Al³⁺, S⁶⁺, Ge⁴⁺, B³⁺.

IT 855205-84-4P
(carbon supported; lithium battery showing both high elec.
potential and lithium intercalation capacity)

RN 855205-84-4 HCPLUS

CN Lithium nickel (diphosphate) metaphosphate (Li₃Ni(P207)(PO₃)₂) (CA
INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O3P | 2 | 15389-19-2 |
| O7P2 | 1 | 14000-31-8 |
| Ni | 1 | 7440-02-0 |
| Li | 3 | 7439-93-2 |

IC ICM H01M004-50
ICS H01M004-52

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

IT Polar solvents
(aprotic, electrolyte solvents; lithium battery showing
both high elec. potential and lithium intercalation capacity)

IT 855205-34-4P
 (carbon supported; lithium battery showing both high elec.
 potential and lithium intercalation capacity)
 IT 7439-93-2D, Lithium, salts
 (electrolyte; lithium battery showing both high elec.
 potential and lithium intercalation capacity)

L20 ANSWER 3 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005:409837 HCPLUS Full-text
 DOCUMENT NUMBER: 142:433175
 TITLE: Electrode active mass for secondary nonaqueous
 electrolyte battery, its manufacture, and
 the battery
 INVENTOR(S): Okada, Shigeto; Yamaki, Jun-ichi; Okazaki,
 Yasunori; Takebe, Hiromichi
 PATENT ASSIGNEE(S): Toyota Jidosha Kabushiki Kaisha, Japan
 SOURCE: PCT Int. Appl., 26 pp.
 CODEN: PIXKD2
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|------------------|------------|
| WO 2005043654 | A1 | 20050512 | WO 2004-JP16506 | 20041101 |
| <-- | | | | |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW | | | | |
| RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| JP 2005158673 | A | 20050616 | JP 2004-84822 | 20040323 |
| <-- | | | | |
| CA 2543711 | A1 | 20050512 | CA 2004-2543711 | 20041101 |
| <-- | | | | |
| EP 1684370 | A1 | 20060726 | EP 2004-799529 | 20041101 |
| <-- | | | | |
| R: DE, FR, GB CN 1875506 | A | 20061206 | CN 2004-80032286 | 20041101 |
| <-- | | | | |
| US 20060194113 | A1 | 20060831 | US 2006-413168 | 20060428 |
| <-- | | | | |
| KR 808124 | B1 | 20080229 | KR 2006-710676 | 20060530 |
| <-- | | | | |
| PRIORITY APPLN. INFO.: | | | JP 2003-373359 | A 20031031 |
| | | | <-- | |
| | | | JP 2004-84822 | A 20040323 |
| | | | WO 2004-JP16506 | W 20041101 |

ED Entered STN: 13 May 2005

AB The active mass mainly contains an amorphous metal composite phosphate: AxM(PO₄)_y [A = alkali metal; M = transition metal(s); x = 0-2; and 0 < y ≤ 2]; and is manufactured by preparing a mixture which contains an alkali metal salt, a transition metal oxide, and a P compound; and rapid-solidifying the mixture from its melt state; or by amphorsizing the above metal composite phosphate. The battery has a cathode, containing the above active mass, an anode, containing an alkali metal-intercalating material and a nonaq. or solid electrolyte.

IT 223571-46-8P, Iron lithium phosphorus oxide

(comps. and manufacture of cathode active mass containing transition metal composite phosphates for secondary batteries)

RN 223571-46-8 HCPLUS

CN Iron lithium phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Li | x | 7439-93-2 |
| Fe | x | 7439-89-6 |

IC ICM H01M004-58

ICS H01M004-02; H01M010-40; C01B025-45

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 15365-14-7P, Iron lithium phosphate (FeLiPO₄) 223571-46-8P,

Iron lithium phosphorus oxide

(comps. and manufacture of cathode active mass containing transition metal composite phosphates for secondary batteries)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 4 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:906086 HCPLUS Full-text

DOCUMENT NUMBER: 1411382165

TITLE: Solid electrolyte and total solid secondary battery containing the electrolyte

INVENTOR(S): Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki; Ito, Shuji

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: PCT Int. Appl., 41 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| WO 2004093236 | A1 | 20041028 | WO 2004-JP5424 | 20040415 |

<--

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
 AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE,
 DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT,
 RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
 ML, MR, NE, SN, TD, TG

| | | | | |
|------------------------|----|----------|------------------|------------|
| JP 2004335455 | A | 20041125 | JP 2004-119042 | 20040414 |
| | | | <-- | |
| JP 3690684 | B2 | 20050831 | | |
| EP 1630893 | A1 | 20060301 | EP 2004-727754 | 20040415 |
| | | | <-- | |
| R: DE, FR, GB | | | | |
| CN 1751409 | A | 20060322 | CN 2004-80004511 | 20040415 |
| | | | <-- | |
| US 20060216611 | A1 | 20060928 | US 2005-551935 | 20051004 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 2003-113850 | A 20030418 |
| | | | <-- | |
| | | | WO 2004-JP5424 | W 20040415 |

ED Entered STN: 29 Oct 2004
 AB The electrolyte, comprising Li, O, P and a transition metal element, is represented by Li_xStyO_z ($T = \text{transition metal}$; $x = 2\text{-}7$; $y = 0.01\text{-}1$; and $z = 3.5\text{-}8$). The battery has the above electrolyte between a cathode and an anode.
 IT 782495-23-2, Lithium titanium metaphosphate oxide
 $(\text{Li}_{2.8}\text{TiO}_{2.2}(\text{PO}_3)_{0.9})$ 782495-24-3, Lithium vanadium metaphosphate oxide ($\text{Li}_{2.8}\text{V}_{0.2}(\text{PO}_3)_{0.9}$) 782495-25-4,
 Chromium lithium metaphosphate oxide ($\text{Cr}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{0.9}$)
 782495-26-5, Lithium manganese metaphosphate oxide
 $(\text{Li}_{2.8}\text{Mn}_{0.2}(\text{PO}_3)_{0.9})$ 782495-27-6, Iron lithium metaphosphate oxide ($\text{Fe}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{0.9}$) 782495-28-7,
 Cobalt lithium metaphosphate oxide ($\text{Co}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{0.9}$)
 782495-29-8, Lithium nickel metaphosphate oxide
 $(\text{Li}_{2.8}\text{Ni}_{0.2}(\text{PO}_3)_{0.9})$ 782495-30-1, Copper lithium metaphosphate oxide ($\text{Cu}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{0.9}$) 782495-31-2,
 Lithium zirconium metaphosphate oxide ($\text{Li}_{2.8}\text{Zr}_{0.2}(\text{PO}_3)_{0.9}$)
 782495-32-3, Lithium niobium metaphosphate oxide
 $(\text{Li}_{2.8}\text{Nb}_{0.2}(\text{PO}_3)_{0.9})$ 782495-33-4, Lithium molybdenum metaphosphate oxide ($\text{Li}_{2.8}\text{Mo}_{0.2}(\text{PO}_3)_{0.9}$) 782495-34-5,
 Lithium ruthenium metaphosphate oxide ($\text{Li}_{2.8}\text{Ru}_{0.2}(\text{PO}_3)_{0.9}$)
 782495-35-6, Lithium silver metaphosphate oxide
 $(\text{Li}_{2.8}\text{Ag}_{0.2}(\text{PO}_3)_{0.9})$ 782495-36-7, Lithium tantalum metaphosphate oxide ($\text{Li}_{2.8}\text{Ta}_{0.2}(\text{PO}_3)_{0.9}$) 782495-37-8,
 Lithium tungsten metaphosphate oxide ($\text{Li}_{2.8}\text{W}_{0.2}(\text{PO}_3)_{0.9}$)
 782495-38-9, Lithium platinum metaphosphate oxide
 $(\text{Li}_{2.8}\text{Pt}_{0.2}(\text{PO}_3)_{0.9})$ 782495-39-0, Gold lithium metaphosphate oxide ($\text{Au}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{0.9}$) 782495-41-4,
 Lithium tungsten metaphosphate oxide ($\text{Li}_{2.8}\text{W}_{0.01}(\text{PO}_3)_{0.9}$)
 782495-42-5, Lithium tungsten metaphosphate oxide
 $(\text{Li}_{2.8}\text{W}_{0.05}(\text{PO}_3)_{0.9})$ 782495-43-6, Lithium tungsten metaphosphate oxide ($\text{Li}_{2.8}\text{W}_{0.1}(\text{PO}_3)_{0.9}$) 782495-44-7,
 Lithium tungsten metaphosphate oxide ($\text{Li}_{2.8}\text{W}_{0.5}(\text{PO}_3)_{0.9}$)
 782495-45-8, Lithium tungsten metaphosphate oxide
 $(\text{Li}_{2.8}\text{W}_{0.52}(\text{PO}_3)_{0.9})$ 782495-46-9, Lithium tungsten metaphosphate oxide ($\text{Li}_{2.8}\text{W}_{0.6}(\text{PO}_3)_{0.9}$)
 (solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)
 RN 782495-23-2 HCPLUS
 CN Lithium titanium metaphosphate oxide ($\text{Li}_{2.8}\text{TiO}_{2.2}(\text{PO}_3)_{0.9}$) (CA INDEX NAME)

10/551,935

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Ti | 0.2 | 7440-32-6 |
| Li | 2.8 | 7439-93-2 |

RN 782495-24-3 HCPLUS

CN Lithium vanadium metaphosphate oxide ($\text{Li}_{2.8}\text{V}_{0.2}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| V | 0.2 | 7440-62-2 |
| Li | 2.8 | 7439-93-2 |

RN 782495-25-4 HCPLUS

CN Chromium lithium metaphosphate oxide ($\text{Cr}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Cr | 0.2 | 7440-47-3 |
| Li | 2.8 | 7439-93-2 |

RN 782495-26-5 HCPLUS

CN Lithium manganese metaphosphate oxide ($\text{Li}_{2.8}\text{Mn}_{0.2}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Mn | 0.2 | 7439-96-5 |
| Li | 2.8 | 7439-93-2 |

RN 782495-27-6 HCPLUS

CN Iron lithium metaphosphate oxide ($\text{Fe}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Li | 2.8 | 7439-93-2 |
| Fe | 0.2 | 7439-89-6 |

RN 782495-28-7 HCPLUS

CN Cobalt lithium metaphosphate oxide ($\text{Co}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

10/551,935

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | 0.9 | | 17778-80-2 | |
| O3P | | 1 | | 15389-19-2 | |
| Co | | 0.2 | | 7440-48-4 | |
| Li | | 2.8 | | 7439-93-2 | |

RN 782495-29-8 HCPLUS
CN Lithium nickel metaphosphate oxide (Li_{2.8}Ni_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | 0.9 | | 17778-80-2 | |
| O3P | | 1 | | 15389-19-2 | |
| Ni | | 0.2 | | 7440-02-0 | |
| Li | | 2.8 | | 7439-93-2 | |

RN 782495-30-1 HCPLUS
CN Copper lithium metaphosphate oxide (Cu_{0.2}Li_{2.8}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | 0.9 | | 17778-80-2 | |
| O3P | | 1 | | 15389-19-2 | |
| Cu | | 0.2 | | 7440-50-8 | |
| Li | | 2.8 | | 7439-93-2 | |

RN 782495-31-2 HCPLUS
CN Lithium zirconium metaphosphate oxide (Li_{2.8}Zr_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | 0.9 | | 17778-80-2 | |
| O3P | | 1 | | 15389-19-2 | |
| Zr | | 0.2 | | 7440-67-7 | |
| Li | | 2.8 | | 7439-93-2 | |

RN 782495-32-3 HCPLUS
CN Lithium niobium metaphosphate oxide (Li_{2.8}Nb_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | 0.9 | | 17778-80-2 | |
| O3P | | 1 | | 15389-19-2 | |
| Nb | | 0.2 | | 7440-03-1 | |
| Li | | 2.8 | | 7439-93-2 | |

RN 782495-33-4 HCPLUS
CN Lithium molybdenum metaphosphate oxide (Li_{2.8}Mo_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

10/551,935

| Component | Ratio | Component | |
|------------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 0.9 | | 17778-80-2 |
| O ₃ P | 1 | | 15389-19-2 |
| Mo | 0.2 | | 7439-98-7 |
| Li | 2.8 | | 7439-93-2 |

RN 782495-34-5 HCPLUS
CN Lithium ruthenium metaphosphate oxide (Li_{2.8}Ru_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component | |
|------------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 0.9 | | 17778-80-2 |
| O ₃ P | 1 | | 15389-19-2 |
| Ru | 0.2 | | 7440-18-8 |
| Li | 2.8 | | 7439-93-2 |

RN 782495-35-6 HCPLUS
CN Lithium silver metaphosphate oxide (Li_{2.8}Ag_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component | |
|------------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 0.9 | | 17778-80-2 |
| O ₃ P | 1 | | 15389-19-2 |
| Ag | 0.2 | | 7440-22-4 |
| Li | 2.8 | | 7439-93-2 |

RN 782495-36-7 HCPLUS
CN Lithium tantalum metaphosphate oxide (Li_{2.8}Ta_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component | |
|------------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 0.9 | | 17778-80-2 |
| O ₃ P | 1 | | 15389-19-2 |
| Ta | 0.2 | | 7440-25-7 |
| Li | 2.8 | | 7439-93-2 |

RN 782495-37-8 HCPLUS
CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component | |
|------------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 0.9 | | 17778-80-2 |
| O ₃ P | 1 | | 15389-19-2 |
| W | 0.2 | | 7440-33-7 |
| Li | 2.8 | | 7439-93-2 |

RN 782495-38-9 HCPLUS
CN Lithium platinum metaphosphate oxide (Li_{2.8}Pt_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

10/551,935

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Pt | 0.2 | 7440-06-4 |
| Li | 2.8 | 7439-93-2 |

RN 782495-39-0 HCPLUS
CN Gold lithium metaphosphate oxide (Au0.2Li2.8(PO3)00.9) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| Au | 0.2 | 7440-57-5 |
| Li | 2.8 | 7439-93-2 |

RN 782495-41-4 HCPLUS
CN Lithium tungsten metaphosphate oxide (Li2.8W0.01(PO3)00.9) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.01 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

RN 782495-42-5 HCPLUS
CN Lithium tungsten metaphosphate oxide (Li2.8W0.05(PO3)00.9) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.05 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

RN 782495-43-6 HCPLUS
CN Lithium tungsten metaphosphate oxide (Li2.8W0.1(PO3)00.9) (CA INDEX
NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.1 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

RN 782495-44-7 HCPLUS
CN Lithium tungsten metaphosphate oxide (Li2.8W0.5(PO3)00.9) (CA INDEX
NAME)

10/551,935

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.5 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

RN 782495-45-8 HCPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.52}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.52 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

RN 782495-46-9 HCPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.6}(PO₃)_{0.9}) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O3P | 1 | 15389-19-2 |
| W | 0.6 | 7440-33-7 |
| Li | 2.8 | 7439-93-2 |

IC ICM H01M010-36

ICS H01B001-06

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary battery solid electrolyte lithium transition metal phosphorus oxide

IT Battery electrolytes

Secondary batteries

(solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

IT 782495-70-9, Lithium tungsten oxide phosphate (Li_{3.2}W_{0.100.4}(PO₄))782495-72-1, Lithium tungsten oxide phosphate (Li_{3.66}W_{0.3301.32}(PO₄))

(solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

IT 782495-67-4, Lithium tungsten oxide phosphate (Li_{3.5}W_{0.250}(PO₄))

(solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂) 782495-23-2,Lithium titanium metaphosphate oxide (Li_{2.8}TiO₂(PO₃)_{0.9})

782495-24-3, Lithium vanadium metaphosphate oxide

(Li_{2.8}V_{0.2}(PO₃)_{0.9}) 782495-25-4, Chromium lithiummetaphosphate oxide (Cr_{0.2}Li_{2.8}(PO₃)_{0.9}) 782495-26-5,Lithium manganese metaphosphate oxide (Li_{2.8}MnO₂(PO₃)_{0.9})

782495-27-6, Iron lithium metaphosphate oxide

(Fe_{0.2}Li_{2.8}(PO₃)_{0.9}) 782495-28-7, Cobalt lithiummetaphosphate oxide (Co_{0.2}Li_{2.8}(PO₃)_{0.9}) 782495-29-8,Lithium nickel metaphosphate oxide (Li_{2.8}NiO₂(PO₃)_{0.9})

782495-30-1, Copper lithium metaphosphate oxide

(Cu_{0.2}Li_{2.8}(PO₃)_{0.9}) 782495-31-2, Lithium zirconium

metaphosphate oxide (Li₂.8Zr0.2(PO₃)O0.9) 782495-32-3,
 Lithium niobium metaphosphate oxide (Li₂.8Nb0.2(PO₃)O0.9)
 782495-33-4, Lithium molybdenum metaphosphate oxide
 (Li₂.8Mo0.2(PO₃)O0.9) 782495-34-5, Lithium ruthenium
 metaphosphate oxide (Li₂.8Ru0.2(PO₃)O0.9) 782495-35-6,
 Lithium silver metaphosphate oxide (Li₂.8Ag0.2(PO₃)O0.9)
 782495-36-7, Lithium tantalum metaphosphate oxide
 (Li₂.8Ta0.2(PO₃)O0.9) 782495-37-8, Lithium tungsten
 metaphosphate oxide (Li₂.8W0.2(PO₃)O0.9) 782495-38-9,
 Lithium platinum metaphosphate oxide (Li₂.8Pt0.2(PO₃)O0.9)
 782495-39-0, Gold lithium metaphosphate oxide
 (Au0.2Li₂.8(PO₃)O0.9) 782495-40-3, Lithium metaphosphate oxide
 (Li₂.8(PO₃)O0.9) 782495-41-4, Lithium tungsten metaphosphate
 oxide (Li₂.8W0.01(PO₃)O0.9) 782495-42-5, Lithium tungsten
 metaphosphate oxide (Li₂.8W0.05(PO₃)O0.9) 782495-43-6,
 Lithium tungsten metaphosphate oxide (Li₂.8W0.1(PO₃)O0.9)
 782495-44-7, Lithium tungsten metaphosphate oxide
 (Li₂.8W0.5(PO₃)O0.9) 782495-45-8, Lithium tungsten
 metaphosphate oxide (Li₂.8W0.52(PO₃)O0.9) 782495-46-9,
 Lithium tungsten metaphosphate oxide (Li₂.8W0.6(PO₃)O0.9)
 782495-47-0, Lithium vanadium oxide phosphate (Li₂.8V0.200.4(PO₄))
 782495-48-1, Chromium lithium oxide phosphate (Cr0.2Li₂.800.2(PO₄))
 782495-49-2, Lithium manganese oxide phosphate (Li₂.8Mn0.200.3(PO₄))
 782495-50-5, Iron lithium oxide phosphate (Fe0.2Li₂.800.17(PO₄))
 782495-51-6, Cobalt lithium oxide phosphate (Co0.2Li₂.800.17(PO₄))
 782495-52-7, Lithium nickel oxide phosphate (Li₂.8Ni0.200.1(PO₄))
 782495-53-8, Copper lithium oxide phosphate (Cu0.2Li₂.800.1(PO₄))
 782495-54-9, Lithium zirconium oxide phosphate (Li₂.8Zr0.200.3(PO₄))
 782495-55-0, Lithium niobium oxide phosphate (Li₂.8Nb0.200.4(PO₄))
 782495-56-1, Lithium molybdenum oxide phosphate (Li₂.8Mo0.200.5(PO₄))
 782495-57-2, Lithium silver phosphate (Li₂.8Ag0.2(PO₄)) 782495-58-3,
 Lithium tantalum oxide phosphate (Li₂.8Ta0.200.4(PO₄)) 782495-59-4,
 Lithium tungsten oxide phosphate (Li₂.8W0.200.5(PO₄)) 782495-60-7,
 Lithium titanium oxide phosphate (Li₄Ti₁₀.250(PO₄)) 782495-61-8,
 Lithium vanadium oxide phosphate (Li₃.75V0.250(PO₄)) 782495-62-9,
 Chromium lithium oxide phosphate (Cr0.25Li₃.50(PO₄)) 782495-63-0,
 Lithium manganese oxide phosphate (Li₃.25Mn0.250(PO₄)) 782495-64-1,
 Lithium niobium oxide phosphate (Li₃.75Nb0.250(PO₄)) 782495-65-2,
 Lithium molybdenum oxide phosphate (Li₃.5Mo0.250(PO₄)) 782495-66-3,
 Lithium tantalum oxide phosphate (Li₃.75Ta0.250(PO₄)) 782495-69-6,
 Lithium tungsten oxide phosphate (Li₃.02W0.0100.04(PO₄))
 782495-74-3, Lithium tungsten oxide phosphate (Li₅W04(PO₄))
 782495-76-5, Lithium tungsten oxide phosphate (Li₇W208(PO₄))
 (solid electrolytes containing lithium transition metal
 phosphorus oxides for secondary batteries)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L20 ANSWER 5 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:139847 HCPLUS [Full-text](#)
 DOCUMENT NUMBER: 140:184700
 TITLE: Secondary lithium battery and its cathode
 INVENTOR(S): Tanjo, Yuji
 PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2004055328 | A | 20040219 | JP 2002-210958 --> | 20020719 |
| PRIORITY APPLN. INFO.: | | | JP 2002-210958 --> | 20020719 |

ED Entered STN: 20 Feb 2004

AB The battery has ≥ 1 Li containing multiple oxide cathodes, ≥ 1 Li intercalating carbonaceous anodes, separators between the cathodes and anodes, and a Li⁺ conducting electrolyte solution; where the cathode active mass is a Li containing multiple oxide, selected from Li Mn oxide, Li Ni oxide, Li Co oxide, Li Fe P oxide, and Li Mn P oxide and has average particle diameter $\leq 1 \mu\text{m}$. Preferably, the cathodes contain $\geq 20\%$ conductor and are 50-150 μm thick.
 IT 138758-08-4, Lithium manganese phosphorus oxide
 223571-46-8, Iron lithium phosphorus oxide

(fine lithium containing multiple oxide particles with controlled particle size for secondary lithium battery cathodes)

RN 138758-08-4 HCPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Mn | x | 7439-96-5 |
| Li | x | 7439-93-2 |

RN 223571-46-8 HCPLUS

CN Iron lithium phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Li | x | 7439-93-2 |
| Fe | x | 7439-89-6 |

IC ICM H01M004-58

ICS H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiation, and Thermal Energy Technology)

IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 39300-70-4, Lithium nickel oxide 52627-24-4, Cobalt lithium oxide 138758-08-4, Lithium manganese phosphorus oxide 223571-46-8, Iron lithium phosphorus oxide

(fine lithium containing multiple oxide particles with controlled particle size for secondary lithium battery cathodes)

L20 ANSWER 6 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:98113 HCPLUS Full-text

DOCUMENT NUMBER: 140:155565

TITLE: Lithium ion conductors showing high ionic conductivity at room temperatures

INVENTOR(S): Ishikawa, Yuichi; Fukui, Toshimi; Hori, Masanori

PATENT ASSIGNEE(S): Kansai Research Institute Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE:

Patent

LANGUAGE:

Japanese

FAMILY ACC. NUM. COUNT:

1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2004039549 | A | 20040205 | JP 2002-197531 <-- | 20020705 |
| PRIORITY APPLN. INFO.: | | | JP 2002-197531 <-- | 20020705 |

ED Entered STN: 06 Feb 2004

AB The ion conductors, useful as solid electrolytes for secondary batteries, electrochromic devices, etc., comprise oxides containing Li, S, P, and Zr satisfying mol ratio of S/(S + P) 0.1-0.9, Li content (as Li₂O) 20-50 mol%, and Zr content (as ZrO₂) 10-50 mol%.IT 651724-47-9P
(lithium ion conductors containing Li S P Zr oxides showing high ionic conductivity at room temps.)

RN 651724-47-9 HCPLUS

CN Lithium phosphorus sulfur zirconium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| S | x | 7704-34-9 |
| Zr | x | 7440-67-7 |
| Li | x | 7439-93-2 |

IC ICM H01M010-40
ICS C01G025-00; H01B001-06; H01B001-08

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 52

ST lithium sulfur phosphorus zirconium oxide ionic conductor; solid electrolyte electrochromic device secondary battery lithium

IT Electrochromic devices
Ionic conductors

Solid electrolytes

(lithium ion conductors containing Li S P Zr oxides showing high ionic conductivity at room temps.)

IT 651724-47-9P

(lithium ion conductors containing Li S P Zr oxides showing high ionic conductivity at room temps.)

L20 ANSWER 7 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2003:796193 HCPLUS Full-text

DOCUMENT NUMBER: 139:310049

TITLE: Batteries comprising alkali-transition metal phosphates and preferred electrolytes

INVENTOR(S): Pugh, James; Saidi, Mohammed Y.; Huang, Haitao
PATENT ASSIGNEE(S): USASOURCE: U.S. Pat. Appl. Publ., 24 pp.
CODEN: USXXCODOCUMENT TYPE: Patent
LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|------------------------|------------|
| US 20030190527 | A1 | 20031009 | US 2002-116276 <-- | 20020403 |
| CA 2479790 | A1 | 20031016 | CA 2003-2479790 <-- | 20030327 |
| WO 2003085757 | A1 | 20031016 | WO 2003-US9634 <-- | 20030327 |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG | | | | |
| AU 2003224801 | A1 | 20031020 | AU 2003-224801 <-- | 20030327 |
| EP 1490917 | A1 | 20041229 | EP 2003-721492 <-- | 20030327 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| JP 2005522009 | T | 20050721 | JP 2003-582838 <-- | 20030327 |
| CN 1650450 | A | 20050803 | CN 2003-810033 <-- | 20030327 |
| US 20050181283 | A1 | 20050818 | US 2005-80605 <-- | 20050315 |
| PRIORITY APPLN. INFO.: | | | US 2002-116276 <-- | A 20020403 |
| | | | WO 2003-US9634 <-- | W 20030327 |

ED Entered STN: 10 Oct 2003

AB Lithium batteries comprising: (a) an electrode comprising a material $\text{AaMb}(\text{XY})_c\text{Zd}$, wherein (i) A is an alkali metal and $0 < \text{a} \leq 9$; (ii) M comprises a transition metal, and $1 \leq \text{b} \leq 3$; (iii) XY is $\text{X}'\text{O}4-\text{X}'\text{y}$, $\text{X}'\text{O}4-\text{yY}'2\text{y}$, $\text{X}'\text{S}4$, or mixts. thereof, where X' is P, As, Sb, Si, Ge, V, S, or mixts. thereof; Y' is P, As, Sb, Si, Ge, V, or mixts. thereof; Y' is halogen, S, N, or mixts. thereof; $0 \leq \text{x} < 3$; and $0 < \text{y} \leq 2$; and $0 < \text{c} \leq 3$; and (iv) Z is OH, halogen, or mixts. thereof, and $0 \leq \text{d} \leq 6$; and (b) a counter-electrode; and (c) an electrolyte comprising an alkyl and/or alkylene carbonate and a cyclic ester. Preferably, M addnl. comprises at least one non-transition metal. Preferred embodiments include those having an olivine structure, where c = 1, and those having a NASICON structure, where c = 3.

IT 610321-55-6 610321-60-3 610754-69-3

(batteries comprising alkali-transition metal phosphates and preferred electrolytes)

RN 610321-55-6 HCAPLUS

CN Cobalt iron lithium magnesium titanium fluoride metaphosphate oxide ($\text{Co}_0.8\text{Fe}_0.1\text{Li}_1.02\text{Mg}_0.02\text{Ti}_0.02\text{F}_0.02(\text{PO}_3)_0.98$) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 0.98 | 17778-80-2 |

10/551,935

| | | | | |
|-----|--|------|--|------------|
| O3P | | 1 | | 15389-19-2 |
| F | | 0.02 | | 14762-94-8 |
| Co | | 0.8 | | 7440-48-4 |
| Ti | | 0.02 | | 7440-32-6 |
| Mg | | 0.02 | | 7439-95-4 |
| Li | | 1.02 | | 7439-93-2 |
| Fe | | 0.1 | | 7439-89-6 |

RN 610321-60-3 HCPLUS

CN Aluminum cobalt iron lithium magnesium fluoride metaphosphate oxide
(Al0.02Co0.8Fe0.1LiMg0.05F0.02(PO3)0.098) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.98 | | 17778-80-2 |
| O3P | | 1 | | 15389-19-2 |
| F | | 0.02 | | 14762-94-8 |
| Co | | 0.8 | | 7440-48-4 |
| Mg | | 0.05 | | 7439-95-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.1 | | 7439-89-6 |
| Al | | 0.02 | | 7429-90-5 |

RN 610754-69-3 HCPLUS

CN Aluminum calcium cobalt iron lithium fluoride metaphosphate oxide
(Al0.02Ca0.05Co0.8Fe0.1LiF0.02(PO3)0.098) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.98 | | 17778-80-2 |
| O3P | | 1 | | 15389-19-2 |
| F | | 0.02 | | 14762-94-8 |
| Ca | | 0.05 | | 7440-70-2 |
| Co | | 0.8 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.1 | | 7439-89-6 |
| Al | | 0.02 | | 7429-90-5 |

IC ICM H01M004-58

INCL 429231900; 429231950; 429221000; 429223000; 429231500; 429224000;
429231600CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

IT Battery cathodes

Battery electrolytes

(batteries comprising alkali-transition metal phosphates and
preferred electrolytes)

IT Chalcogenides

Oxides (inorganic), uses

(batteries comprising alkali-transition metal phosphates and
preferred electrolytes)

IT Carbonates, uses

(esters; batteries comprising alkali-transition metal phosphates
and preferred electrolytes)

IT Secondary batteries

(lithium; batteries comprising alkali-transition metal phosphates
and preferred electrolytes)IT 57-57-8, β -Propiolactone 96-48-0, γ -Butyrolactone

96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7,
 1,2-Propylene carbonate 502-44-3, ϵ -Caprolactone 542-28-9,
 δ -Valerolactone 616-38-6, Dimethyl carbonate 623-53-0, Ethyl
 methyl carbonate 2453-03-4, 1,3-Propylene carbonate 4427-90-1,
 1,5-Pentylene carbonate 4427-94-5, 1,4-Butylene carbonate
 4437-70-1, 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate
 7440-44-0, Carbon, uses 7550-35-8, Lithium bromide (LiBr)
 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate
 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium
 tetrafluoroborate 14485-20-2, Lithium tetraphenylborate
 15365-14-7, Iron lithium phosphate felipo4 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium triflate 90076-65-6 132843-44-8 610271-90-4
 610271-94-8 610272-06-5 610310-87-7 610310-88-8 610310-92-4
 610310-95-7 610310-97-9 610310-99-1 610311-00-7
 610321-55-6 610321-60-3 610754-69-3
 (batteries comprising alkali-transition metal phosphates and
 preferred electrolytes)

IT 477779-87-6P, Sodium vanadium fluoride phosphate NaVF(PO₄)
 484040-01-9P, Iron lithium magnesium fluoride phosphate
 Fe_{0.9}Li_{1.25}Mg_{0.1}Fe_{0.25}(PO₄)₂ 484040-22-4P, Lithium vanadium fluoride
 phosphate (Li₆V₂Fe(PO₄)₃) 484040-28-0P 610272-07-6P 610311-01-8P
 (batteries comprising alkali-transition metal phosphates and
 preferred electrolytes)

L20 ANSWER 8 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:807222 HCPLUS Full-text
 DOCUMENT NUMBER: 137:327378
 TITLE: Production of spinel-type lithium manganate.
 INVENTOR(S): Kamata, Tsuneyoshi; Numata, Koichi
 PATENT ASSIGNEE(S): Mitsui Mining and Smelting Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 19 pp.
 CODEN: JKXXAF

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2002308628 | A | 20021023 | JP 2001-111751 <-- | 20010410 |
| PRIORITY APPLN. INFO.: | | | JP 2001-111751 <-- | 20010410 |

ED Entered STN: 23 Oct 2002

AB The title process includes pulverizing electrolysis precipitated MnO₂, neutralizing by NaOH or Na₂CO₃ to obtain electrolytic MnO₂ having pH ≥ 2 and sp. surface area 50 m²/g and P content 0.1-1 weight%, mixing the electrolytic MnO₂ with Li-containing raw material (e.g., Li₂CO₃, LiNO₃ or LiOH) and a compound containing Mg, Al, Ni, Co, Fe, Cu, Zn, Ca, Si, P, Ti, Cr, Na, K, V and/or B (where 0.05-12.5 mol% Mn is substituted by those elements), and firing. The spinel-type Li manganate (partially substituted) can be used as cathode material of nonaq. electrolyte secondary batteries.

IT 138758-08-4P, Lithium manganese phosphorus oxide
 (spinel-type; production of spinel-type lithium manganate)

RN 138758-08-4 HCPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------|
|-----------|--|-------|--|-----------|

| Registry Number

| | | | |
|----|---|--|------------|
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Mn | x | | 7439-96-5 |
| Li | x | | 7439-93-2 |

IC ICM C01G045-00

ICS H01M004-02; H01M004-58; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49

ST spinel type lithium manganate prodn phosphorus content; partial substitution spinel type lithium manganate prodn phosphorus content; nonaq electrolyte secondary battery cathode material lithium manganate prodn

IT Secondary batteries

(nonaq. electrolyte, cathode material of; production of spinel-type lithium manganate for)

IT 61179-01-9P, Aluminum lithium manganese oxide 133782-19-1P, Lithium manganese vanadium oxide 138758-08-4P, Lithium manganese phosphorus oxide 153327-02-7P, Boron lithium manganese oxide 162684-16-4P, Lithium manganese nickel oxide 173525-03-6P, Lithium manganese sodium oxide 175786-46-6P, Lithium magnesium manganese oxide 187156-09-8P, Lithium manganese zinc oxide 191538-04-2P, Copper lithium manganese oxide 204450-96-4P, Chromium lithium manganese oxide 208394-04-1P, Lithium manganese titanium oxide 214536-41-1P, Cobalt lithium manganese oxide 245085-55-6P, Calcium lithium manganese oxide 252568-44-8P, Lithium manganese silicon oxide 273725-34-1P, Lithium manganese potassium oxide (spinel-type; production of spinel-type lithium manganate)

L20 ANSWER 9 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:807221 HCPLUS Full-text

DOCUMENT NUMBER: 137:327377

TITLE: Production of spinel-type lithium manganate.

INVENTOR(S): Kamata, Tsuneyoshi; Numata, Koichi

PATENT ASSIGNEE(S): Mitsui Mining and Smelting Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| JP 2002308627 | A | 20021023 | JP 2001-111690 | 20010410 |

<--

PRIORITY APPLN. INFO.: JP 2001-111690 20010410
<--

ED Entered STN: 23 Oct 2002

AB The title process includes pulverizing electrolysis precipitated MnO₂, neutralizing by NaOH or NaCO₃ to obtain electrolytic MnO₂ having pH ≥ 2 and sp. surface area 50 m²/g, mixing the electrolytic MnO₂ with Li-containing raw material (e.g., Li₂CO₃, LiNO₃ or LiOH) and a compound containing Mg, Al, Ni, Co, Fe, Cu, Zn, Ca, Si, P, Ti, Cr, Na, K, V and/or B (where 0.05-12.5 mol% Mn is substituted by those elements), and firing. The spinel-type Li manganate (partially substituted) can be used as cathode material of nonaq. electrolyte secondary batteries.

IT 138758-08-4P, Lithium manganese phosphorus oxide

(spinel-type; production of spinel-type lithium manganate)
 RN 138758-08-4 HCAPLUS
 CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Mn | x | 7439-96-5 |
| Li | x | 7439-93-2 |

IC ICM C01G045-00
 ICS H01M004-02; H01M004-58; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 ST spinel type lithium manganate prodn; partial substitution spinel type lithium manganate prodn; nonaq electrolyte secondary battery cathode material lithium manganate prodn
 IT Secondary batteries
 (nonaq. electrolyte, cathode material of; production of spinel-type lithium manganate for)
 IT 61179-01-9P, Aluminum lithium manganese oxide 133782-19-1P, Lithium manganese vanadium oxide 138758-08-4P, Lithium manganese phosphorus oxide 153327-02-7P, Boron lithium manganese oxide 162684-16-4P, Lithium manganese nickel oxide 173525-03-6P, Lithium manganese sodium oxide 175786-46-6P, Lithium magnesium manganese oxide 187156-09-8P, Lithium manganese zinc oxide 191538-04-2P, Copper lithium manganese oxide 204450-96-4P, Chromium lithium manganese oxide 208394-04-1P, Lithium manganese titanium oxide 214536-41-1P, Cobalt lithium manganese oxide 245085-55-6P, Calcium lithium manganese oxide 252568-44-8P, Lithium manganese silicon oxide 273725-34-1P, Lithium manganese potassium oxide (spinel-type; production of spinel-type lithium manganate)

L20 ANSWER 10 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:784083 HCAPLUS Full-text
 DOCUMENT NUMBER: 138:273960
 TITLE: Characteristics of lithium-ion-conducting composite polymer-glass secondary cell electrolytes
 AUTHOR(S): Zhang, Xiang-Wu; Wang, Chunsheng; Appleby, A. John; Little, Frank E.
 CORPORATE SOURCE: Texas Engineering Experiment Station, Center for Electrochemical Systems and Hydrogen Research, Texas A and M University, College Station, TX, 77843-3402, USA
 SOURCE: Journal of Power Sources (2002), 112(1), 209-215
 CODEN: JPSODZ; ISSN: 0378-7753
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 15 Oct 2002
 AB A family of lithium-ion-conducting composite polymer-glass electrolytes containing the glass composition 14Li₂O-9Al₂O₃-38TiO₂-39P₂O₅ (abbreviated as (LiAlTiP)xOy) with high ionic conductivity, an excellent electrochem. stability range, and high compatibility with lithium insertion anodes is described. An optimized composition has a room temperature conductivity of 1.7+10⁻⁴ S cm⁻¹, an Li⁺ transference number of 0.39, and an electrochem.

stability window to +5.1 V vs. Li/Li+. It also has good interfacial stability under both open-circuit and lithium metal plating-stripping conditions and provides good shelf-life.

IT 186088-00-6
 (polymer electrolytes in secondary lithium batteries
 containing glass compns. for improved conductivity)
 RN 186088-00-6 HCAPLUS
 CN Aluminum lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|-----------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery composite polymer glass electrolyte
 characteristic

IT Battery electrolytes
 Secondary batteries
 (polymer electrolytes in secondary lithium batteries
 containing glass compns. for improved conductivity)

IT Polyoxalkylenes, uses
 (polymer electrolytes in secondary lithium batteries
 containing glass compns. for improved conductivity)
 IT 7791-03-9, Lithium perchlorate 25322-68-3, Polyethylene oxide
 132843-44-8 186088-00-6
 (polymer electrolytes in secondary lithium batteries
 containing glass compns. for improved conductivity)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L20 ANSWER 11 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:752479 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:281841
 TITLE: Cathode active material for nonaqueous
 electrolyte secondary battery
 INVENTOR(S): Morishima, Hideaki; Yamada, Shuji; Kanai, Hideyuki
 PATENT ASSIGNEE(S): Kabushiki Kaisha Toshiba, Japan
 SOURCE: Eur. Pat. Appl., 29 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------|-----------------|
| EP 1246290 | A2 | 20021002 | EP 2002-252168 | 20020326 <-- |
| EP 1246290 | A3 | 20031119 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| CA 2378278 | A1 | 20020926 | CA 2002-2378278 | 20020322 <-- |
| US 20030054253 | A1 | 20030320 | US 2002-102705 | 20020322 |

| | | | |
|------------------------|----|----------|----------------|
| | | | <-- |
| US 6984470 | B2 | 20060110 | |
| JP 2002358965 | A | 20021213 | JP 2002-87051 |
| | | | <-- |
| JP 3615196 | B2 | 20050126 | |
| US 20060029865 | A1 | 20060209 | US 2005-244042 |
| | | | <-- |
| PRIORITY APPLN. INFO.: | | | JP 2001-87038 |
| | | | <-- |
| | | | US 2002-102705 |
| | | | <-- |

ED Entered STN: 04 Oct 2002

AB The present invention provides a pos. electrode active material containing a lithium-containing composite metal oxide having a composition represented by: LiMg_xM_{1-x}PO₄ where M is at least one kind of an element selected from the group consisting of Co and Ni, and the molar ratio x is larger than 0.5 and smaller than 0.75, i.e., 0.5 < x < 0.75.

IT 464172-19-8P 464172-22-3P 464172-25-6P
 464172-26-9P 464172-31-4P 464172-34-7P
 464172-37-0P 464172-39-2P 464172-42-7P
 464172-45-0P 464172-46-3P 464172-51-8P
 464172-54-1P 464172-57-4P

(cathode active material for nonaq. electrolyte secondary battery)

RN 464172-19-8 HCPLUS

CN Cobalt lithium magnesium metaphosphate oxide silicate
 (Co_{0.9}LiMg_{0.05}(PO₃)_{0.95}CO_{0.75}(SiO₄)_{0.1}) (CA INDEX NAME)

| Component | Ratio | Component |
|-------------------|-------|-----------------|
| | | Registry Number |
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| Co | 0.9 | 7440-48-4 |
| Mg | 0.05 | 7439-95-4 |
| Li | 1 | 7439-93-2 |

RN 464172-22-3 HCPLUS

CN Cobalt lithium vanadium metaphosphate oxide silicate
 (Co_{0.9}LiV_{0.05}(PO₃)_{0.95}CO_{0.75}(SiO₄)_{0.1}) (CA INDEX NAME)

| Component | Ratio | Component |
|-------------------|-------|-----------------|
| | | Registry Number |
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| V | 0.05 | 7440-62-2 |
| Co | 0.9 | 7440-48-4 |
| Li | 1 | 7439-93-2 |

RN 464172-25-6 HCPLUS

CN Chromium cobalt lithium metaphosphate oxide silicate
 (Cr_{0.05}Co_{0.9}Li(PO₃)_{0.95}CO_{0.75}(SiO₄)_{0.1}) (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | 0.75 | 17778-80-2 |

10/551,935

| | | | | |
|------|--|------|--|------------|
| O4Si | | 0.1 | | 17181-37-2 |
| O3P | | 0.95 | | 15389-19-2 |
| Co | | 0.9 | | 7440-48-4 |
| Cr | | 0.05 | | 7440-47-3 |
| Li | | 1 | | 7439-93-2 |

RN 464172-28-9 HCPLUS

CN Cobalt lithium manganese metaphosphate oxide silicate
(Co0.9LiMn0.05(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.75 | | 17778-80-2 |
| O4Si | | 0.1 | | 17181-37-2 |
| O3P | | 0.95 | | 15389-19-2 |
| Co | | 0.9 | | 7440-48-4 |
| Mn | | 0.05 | | 7439-96-5 |
| Li | | 1 | | 7439-93-2 |

RN 464172-31-4 HCPLUS

CN Cobalt iron lithium metaphosphate oxide silicate
(Co0.9Fe0.05Li(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.75 | | 17778-80-2 |
| O4Si | | 0.1 | | 17181-37-2 |
| O3P | | 0.95 | | 15389-19-2 |
| Co | | 0.9 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.05 | | 7439-89-6 |

RN 464172-34-7 HCPLUS

CN Cobalt copper lithium metaphosphate oxide silicate
(Co0.9Cu0.05Li(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.75 | | 17778-80-2 |
| O4Si | | 0.1 | | 17181-37-2 |
| O3P | | 0.95 | | 15389-19-2 |
| Cu | | 0.05 | | 7440-50-8 |
| Co | | 0.9 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |

RN 464172-37-0 HCPLUS

CN Cobalt lithium zirconium metaphosphate oxide silicate
(Co0.9LiZr0.05(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.75 | | 17778-80-2 |
| O4Si | | 0.1 | | 17181-37-2 |
| O3P | | 0.95 | | 15389-19-2 |
| Zr | | 0.05 | | 7440-67-7 |
| Co | | 0.9 | | 7440-48-4 |

10/551,935

Li | 1 | 7439-93-2

RN 464172-39-2 HCPLUS
 CN Lithium magnesium nickel metaphosphate oxide silicate
 $(\text{LiMgO}_0.05\text{NiO}_0.9(\text{PO}_3)_0.95\text{O}_0.75(\text{SiO}_4)_0.1)$ (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-------------------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| Ni | 0.9 | 7440-02-0 |
| Mg | 0.05 | 7439-95-4 |
| Li | 1 | 7439-93-2 |

RN 464172-42-7 HCPLUS
 CN Lithium nickel vanadium metaphosphate oxide silicate
 $(\text{LiNiO}_0.9\text{V}_0.05(\text{PO}_3)_0.95\text{O}_0.75(\text{SiO}_4)_0.1)$ (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-------------------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| V | 0.05 | 7440-62-2 |
| Ni | 0.9 | 7440-02-0 |
| Li | 1 | 7439-93-2 |

RN 464172-45-0 HCPLUS
 CN Chromium lithium nickel metaphosphate oxide silicate
 $(\text{CrO}_0.05\text{LiNiO}_0.9(\text{PO}_3)_0.95\text{O}_0.75(\text{SiO}_4)_0.1)$ (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-------------------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| Cr | 0.05 | 7440-47-3 |
| Ni | 0.9 | 7440-02-0 |
| Li | 1 | 7439-93-2 |

RN 464172-48-3 HCPLUS
 CN Lithium manganese nickel metaphosphate oxide silicate
 $(\text{LiMnO}_0.05\text{NiO}_0.9(\text{PO}_3)_0.95\text{O}_0.75(\text{SiO}_4)_0.1)$ (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-------------------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O ₄ Si | 0.1 | 17181-37-2 |
| O ₃ P | 0.95 | 15389-19-2 |
| Ni | 0.9 | 7440-02-0 |
| Mn | 0.05 | 7439-96-5 |
| Li | 1 | 7439-93-2 |

RN 464172-51-8 HCPLUS
 CN Iron lithium nickel metaphosphate oxide silicate

10/551,935

(Fe0.05LiNi0.9(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O4Si | 0.1 | 17181-37-2 |
| O3P | 0.95 | 15389-19-2 |
| Ni | 0.9 | 7440-02-0 |
| Li | 1 | 7439-93-2 |
| Fe | 0.05 | 7439-89-6 |

RN 464172-54-1 HCPLUS

CN Copper lithium nickel metaphosphate oxide silicate
(Cu0.05LiNi0.9(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O4Si | 0.1 | 17181-37-2 |
| O3P | 0.95 | 15389-19-2 |
| Cu | 0.05 | 7440-50-8 |
| Ni | 0.9 | 7440-02-0 |
| Li | 1 | 7439-93-2 |

RN 464172-57-4 HCPLUS

CN Lithium nickel zirconium metaphosphate oxide silicate
(LiNi0.9Zr0.05(PO3)0.9500.75(SiO4)0.1) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 0.75 | 17778-80-2 |
| O4Si | 0.1 | 17181-37-2 |
| O3P | 0.95 | 15389-19-2 |
| Zr | 0.05 | 7440-67-7 |
| Ni | 0.9 | 7440-02-0 |
| Li | 1 | 7439-93-2 |

IC ICM H01M010-40

ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery cathodes
(cathode active material for nonaq. electrolyte secondary
battery)IT Secondary batteries
(lithium; cathode active material for nonaq. electrolyte
secondary battery)IT 464171-95-7P, Cobalt lithium magnesium phosphate (Co0.45LiMg0.55(PO4))
464171-96-8P, Cobalt lithium magnesium phosphate (Co0.3LiMg0.7(PO4))
464171-97-9P, Lithium magnesium nickel phosphate (LiMg0.55Ni0.45(PO4))
464171-98-0P, Lithium magnesium nickel phosphate (LiMg0.7Ni0.3(PO4))
464171-99-1P, Cobalt lithium magnesium phosphate
(Co0.85Li1.1Mg0.05(PO4)) 464172-00-7P, Lithium magnesium nickel
phosphate (Li1.1Mg0.05Ni0.85(PO4)) 464172-01-8P, Cobalt lithium
titanium phosphate (Co0.85Li1.1Ti0.05(PO4)) 464172-02-9P, Lithium
nickel titanium phosphate (Li1.1Ni0.85Ti0.05(PO4)) 464172-03-0P,
Cobalt lithium vanadium phosphate (Co0.85Li1.1V0.05(PO4))
464172-04-1P, Lithium nickel vanadium phosphate

(Li₁.1Ni₀.85V₀.05(PO₄)) 464172-05-2P, Chromium cobalt lithium phosphate (Cr₀.05Co₀.85Li₁.1(PO₄)) 464172-06-3P, Chromium lithium nickel phosphate (Cr₀.05Li₁.1Ni₀.85(PO₄)) 464172-07-4P, Cobalt lithium manganese phosphate (Co₀.85Li₁.1Mn₀.05(PO₄)) 464172-08-5P, Lithium manganese nickel phosphate (Li₁.1Mn₀.05Ni₀.85(PO₄)) 464172-09-6P, Cobalt iron lithium phosphate (Co₀.85Fe₀.05Li₁.1(PO₄)) 464172-10-9P, Iron lithium nickel phosphate (Fe₀.05Li₁.1Ni₀.85(PO₄)) 464172-11-0P, Cobalt copper lithium phosphate (Co₀.85Cu₀.05Li₁.1(PO₄)) 464172-12-1P, Copper lithium nickel phosphate (Cu₀.05Li₁.1Ni₀.85(PO₄)) 464172-13-2P, Cobalt lithium zirconium phosphate (Co₀.85Li₁.1Zr₀.05(PO₄)) 464172-14-3P, Lithium nickel zirconium phosphate (Li₁.1Ni₀.85Zr₀.05(PO₄)) 464172-16-5P, Aluminum cobalt lithium phosphate (Al₀.05Co₀.85Li₁.1(PO₄)) 464172-17-6P, Aluminum lithium nickel phosphate (Al₀.05Li₁.1Ni₀.85(PO₄)) 464172-18-7P
 464172-19-8P 464172-20-1P 464172-21-2P
 464172-22-3P 464172-23-4P 464172-24-5P
 464172-25-6P 464172-26-7P 464172-27-8P
 464172-28-9P 464172-29-0P 464172-30-3P
 464172-31-4P 464172-32-5P 464172-33-6P
 464172-34-7P 464172-35-8P 464172-36-9P
 464172-37-0P 464172-38-1P 464172-39-2P
 464172-40-5P 464172-41-6P 464172-42-7P 464172-43-8P
 464172-44-9P 464172-45-0P 464172-46-1P 464172-47-2P
 464172-48-3P 464172-49-4P 464172-50-7P
 464172-51-8P 464172-52-9P 464172-53-0P
 464172-54-1P 464172-55-2P 464172-56-3P
 464172-57-4P 464172-58-5P 464172-59-6P, Cobalt lithium magnesium phosphate (Co₀.94Li₁.01Mg₀.05(PO₄)) 464172-60-9P, Cobalt lithium magnesium phosphate (Co₀.93Li₁.02Mg₀.05(PO₄)) 464172-61-0P, Cobalt lithium magnesium phosphate (Co₀.75Li₁.2Mg₀.05(PO₄)) 464172-62-1P, Cobalt lithium magnesium phosphate (Co₀.7Li₁.25Mg₀.05(PO₄)) 464172-63-2P 464172-64-3P 464172-65-4P 464172-66-5P 464172-67-6P 464172-68-7P 464172-69-8P
 464173-33-9P
 (cathode active material for nonaq. electrolyte secondary battery)

L20 ANSWER 12 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:518137 HCPLUS [Full-text](#)
 DOCUMENT NUMBER: 137:96241
 TITLE: Powdery cathode active mass including olivine structure and secondary nonaqueous electrolyte lithium battery using it
 INVENTOR(S): Nakamura, Masaya; Saito, Hirohiko
 PATENT ASSIGNEE(S): Denso Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2002198050 | A | 20020712 | JP 2000-397537 --> | 20001227 |
| PRIORITY APPLN. INFO.: | | | JP 2000-397537 --> | 20001227 |

ED Entered STN: 12 Jul 2002

AB The cathode active mass contains phosphoric acid compds. with olivine structure represented by $\text{Li}_{1-x}\text{AxFe}_{1-y}\text{M}_z\text{Me}_x\text{P}_1-\text{mXmO}_4-\text{nZn}$ ($A = \text{Na and/or K}$; M is ≥ 1 of metals excluding Fe, Li, and Al; $\text{Me} = \text{Li and/or Al}$; $X = \text{Si, N, As, and/or S}$; $Z = \text{F, Cl, Br, I, S, and/or N}$; $x = 0-0.1$; $y = 0-0.5$; $z = 0-0.3$; $y + z = 0-0.5$; $m = 0-0.3$; $n = 0-0.5$; $x + z + m + n > 0$) in the whole or part of the surfaces of the active mass particles. The battery using the active mass has high charge/discharge efficiency in large current.

IT 441769-69-3 441769-70-6 441769-71-7

(powdery cathode active mass including phosphoric acid compound with olivine structure for nonaq. electrolyte Li battery)

RN 441769-69-3 HCPLUS

CN Cobalt iron lithium fluoride metaphosphate oxide
(Co0.2Fe0.8LiF0.1(PO3)0.9) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|------------------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O ₃ P | 1 | 15389-19-2 |
| F | 0.1 | 14762-94-8 |
| Co | 0.2 | 7440-48-4 |
| Li | 1 | 7439-93-2 |
| Fe | 0.8 | 7439-89-6 |

RN 441769-70-6 HCPLUS

CN Cobalt iron lithium chloride metaphosphate oxide
(Co0.2Fe0.8LiCl0.1(PO3)0.9) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|------------------|-------|--------------------------------|
| Cl | 0.1 | 22537-15-1 |
| O | 0.9 | 17778-80-2 |
| O ₃ P | 1 | 15389-19-2 |
| Co | 0.2 | 7440-48-4 |
| Li | 1 | 7439-93-2 |
| Fe | 0.8 | 7439-89-6 |

RN 441769-71-7 HCPLUS

CN Cobalt iron lithium bromide metaphosphate oxide
(Co0.2Fe0.8LiBr0.1(PO3)0.9) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|------------------|-------|--------------------------------|
| O | 0.9 | 17778-80-2 |
| O ₃ P | 1 | 15389-19-2 |
| Br | 0.1 | 10097-32-2 |
| Co | 0.2 | 7440-48-4 |
| Li | 1 | 7439-93-2 |
| Fe | 0.8 | 7439-89-6 |

RN 441769-72-8 HCPLUS

CN Cobalt iron lithium iodide metaphosphate oxide
(Co0.2Fe0.8LiI0.1(PO3)0.9) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| I | 0.1 | 7527-00-0 |

10/551,935

| | | | | |
|-----|--|-----|--|------------|
| O | | 0.9 | | 17778-80-2 |
| O3P | | 1 | | 15389-19-2 |
| I | | 0.1 | | 14362-44-8 |
| Co | | 0.2 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.8 | | 7439-89-6 |

RN 441769-73-9 HCAPLUS

CN Cobalt iron lithium metaphosphate oxide sulfate
(Co0.2Fe0.8Li(PO3)0.0.5(SO4)0.1) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.5 | | 17778-80-2 |
| O3P | | 1 | | 15389-19-2 |
| O4S | | 0.1 | | 14808-79-8 |
| Co | | 0.2 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.8 | | 7439-89-6 |

RN 441769-74-0 HCAPLUS

CN Cobalt iron lithium metaphosphate nitrate oxide
(Co0.2Fe0.8Li(PO3)(NO3)0.100.6) (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | 0.6 | | 17778-80-2 |
| O3P | | 1 | | 15389-19-2 |
| NO3 | | 0.1 | | 14797-55-8 |
| Co | | 0.2 | | 7440-48-4 |
| Li | | 1 | | 7439-93-2 |
| Fe | | 0.8 | | 7439-89-6 |

IC ICM H01M004-58

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery cathodes

(powdery cathode active mass including phosphoric acid compound with olivine structure for nonaq. electrolyte Li battery)

IT 441769-67-1, Cobalt iron lithium phosphate (Co0.2Fe0.7Li1.1(PO4))

441769-68-2, Aluminum cobalt iron lithium phosphate

(Al1.1Co0.2Fe0.7Li(PO4)) 441769-69-3 441769-70-6

441769-71-7 441769-72-8 441769-73-9

441769-74-6 441769-75-1, Cobalt iron lithium phosphate

silicate (Co0.2Fe0.8Li(PO4)0.9(SiO4)0.1) 441769-76-2 441769-77-3,

Cobalt iron lithium arsenate phosphate (Co0.2Fe0.8Li(AsO4)0.1(PO4)0.9)

441769-78-4, Cobalt iron lithium phosphate sulfate

(Co0.2Fe0.8Li(PO4)0.9(SO4)0.1) 441769-79-5, Cobalt iron lithium

sodium phosphate (Co0.2Fe0.8Li0.95Na0.05(PO4)) 441769-80-8, Cobalt

iron lithium potassium phosphate (Co0.2Fe0.8Li0.95K0.05(PO4))

(powdery cathode active mass including phosphoric acid compound with olivine structure for nonaq. electrolyte Li battery)

L20 ANSWER 13 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:256645 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:297382

TITLE: Carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core

for use as battery electrodes
INVENTOR(S): Armand, Michel; Gauthier, Michel; Magnan,
Jean-Francois; Ravet, Nathalie
PATENT ASSIGNEE(S): Hydro-Quebec, Can.
SOURCE: PCT Int. Appl., 78 pp.
CODEN: PIXD2
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------|----------|
| WO 2002027824 | A1 | 20020404 | WO 2001-CA1350 | 20010921 |
| <-- | | | | |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, US, UZ, VN, YU, ZA, ZW | | | | |
| RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG | | | | |
| CA 2320661 | A1 | 20020326 | CA 2000-2320661 | 20000926 |
| <-- | | | | |
| CA 2423129 | A1 | 20020404 | CA 2001-2423129 | 20010921 |
| <-- | | | | |
| AU 2001093569 | A | 20020408 | AU 2001-93569 | 20010921 |
| <-- | | | | |
| EP 1325526 | A1 | 20030709 | EP 2001-973907 | 20010921 |
| <-- | | | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR | | | | |
| JP 2004509058 | T | 20040325 | JP 2002-531518 | 20010921 |
| <-- | | | | |
| US 20040086445 | A1 | 20040506 | US 2003-362764 | 20030619 |
| <-- | | | | |
| US 7285260 | B2 | 20071023 | | |
| US 20070134554 | A1 | 20070614 | US 2007-655084 | 20070119 |
| <-- | | | | |
| PRIORITY APPLN. INFO.: | | | | |
| CA 2000-2320661 | | | | |
| <-- | | | | |
| WO 2001-CA1350 | | | | |
| <-- | | | | |
| US 2003-362764 | | | | |
| <-- | | | | |

ED Entered STN: 05 Apr 2002

AB Carbon-coated redox materials suitable for use in battery electrodes consist of a core surrounded by a coating, or interconnected by carbon crosslinks, in which the core includes a composition of formula $\text{LiM}_1\text{xM}'_y(\text{XO}_4)_n$, in which $y = 0-0.6$, $x = 0-2$, $n = 0-1.5$; M is a transition metal; and M' is an element of fixed valence selected from Mg²⁺, Ca²⁺, Al³⁺, and Zn²⁺, and X is S, P, and Si. Synthesis of the materials is carried out by reacting a balanced mixture of appropriate precursors in a reducing atmospheric, to adjust the valence of the transition metals, in the presence of a carbon source, which is then pyrolyzed. The resulting products exhibit an excellent elec. conductivity and a highly enhanced chemical activity.

IT 407640-57-7

(metal source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

RN 407640-57-7 HCPLUS

CN Iron lithium manganese phosphorus sulfur oxide (CA INDEX NAME)

| Component | Ratio | Component | Registry Number |
|-----------|---|-----------|-----------------|
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| S | x | | 7704-34-9 |
| Mn | x | | 7439-96-5 |
| Li | x | | 7439-93-2 |
| Fe | x | | 7439-89-6 |
| IC | ICM H01M004-48 | | |
| | ICS C01B025-37; C01B033-20; H01M004-58; H01M004-62; C01B017-96 | | |
| CC | 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) | | |
| IT | 90076-65-6 (electrolyte containing; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes) | | |
| IT | 546-89-4, Lithium acetate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 1309-37-1, Ferric oxide, reactions 1310-65-2, Lithium hydroxide 1313-13-9, Manganese dioxide, reactions 1314-62-1, Vanadium pentoxide, reactions 1317-61-9, Magnetite, reactions 10045-86-0, Ferric phosphate 10102-24-6, Lithium silicate (Li ₂ SiO ₃) 10377-48-7, Lithium sulfate 10377-52-3, Lithium phosphate (Li ₃ PO ₄) 10421-48-4, Ferric nitrate 12057-24-8, Lithium oxide, reactions 12627-14-4 13453-80-0, Lithium dihydrogen phosphate 63985-45-5, Lithium orthosilicate 407640-52-2, Iron lithium manganese phosphate (Fe _{0.1} - ₁ LiMn ₀ - _{0.9} (PO ₄)) 407640-53-3, Iron lithium magnesium phosphate (Fe _{0.7} - ₁ LiMg ₀ - _{0.3} (PO ₄)) 407640-54-4, Calcium iron lithium phosphate (Ca ₀ - _{0.3} Fe _{0.7} - ₁ Li(PO ₄)) 407640-55-5 407640-56-6, Iron lithium phosphate silicate (FeLi ₁ - ₁ (PO ₄) _{0.1} - ₁ (SiO ₄) ₀ - _{0.9}) 407640-57-7 407640-58-8, Iron lithium manganese phosphate sulfate (Fe ₀ - ₁ Li ₁ - ₁ .2Mn ₀ - _{0.2} (PO ₄), (SO ₄)) 407640-59-9, Iron lithium manganese phosphate ((Fe,Mn)Li ₁ - _{1.6} (PO ₄)) 407640-60-2, Iron lithium manganese phosphate sulfate (Fe ₁ - ₂ Li ₁ - ₂ Mn ₀ - ₁ [(PO ₄),(SO ₄)] 407640-61-3, Iron lithium titanium phosphate ((Fe,Ti)Li _{0.5} - ₂ (PO ₄)) (metal source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes) | | |

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 14 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:104869 HCPLUS [Full-text](#)

DOCUMENT NUMBER: 136:153886

TITLE: Lithium manganate-type cathode active mass and secondary lithium battery using it
Shiosaki, Ryiji; Fujii, Akihiro; Okabe, Kazuya; Yufu, Hiroshi

INVENTOR(S): Yuasa Corporation, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2002042812 | A | 20020208 | JP 2000-227758 <-- | 20000727 |
| PRIORITY APPLN. INFO.: | | | JP 2000-227758 <-- | 20000727 |

ED Entered STN: 08 Feb 2002

AB The cathode active mass contains Li Mn mixed oxide $Li_{1+x}[Mn(2-x-y)My]O_4$ containing B by satisfying $Mn(2-x-y)My:B = 2:0.01-0.1$ (where $x = 0-0.3$; $y = 0-0.2$; M = Be, C, Si, P, Sc, Cu, Zn, Ga, Ge, As, Se, Sr, Mo, Pd, Ag, Cd, In, Sn, Sb, Te, Ba, Ta, W, Pb, Bi, Co, Fe, Cr, Ni, Ti, Zr, Nb, Y, Al, Na, K, Mg, Ca, Cs, La, Ce, Nd, Sm, Eu, and/or Tb). The secondary lithium battery is equipped with a cathode containing the active mass, a Li-intercalating anode, and an electrolyte solution containing a F-containing salt. The battery has good storage stability.

IT 138758-08-4, Lithium Manganese phosphorus oxide
(lithium manganese-type cathode active mass containing boron for secondary battery)

RN 138758-08-4 HCAPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Mn | x | 7439-96-5 |
| Li | x | 7439-93-2 |

IC ICM H01M004-58

ICS C01G045-00; H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 21324-40-3, Lithium hexafluorophosphate
(electrolyte; lithium manganese-type cathode active mass containing boron for secondary battery)

IT 53027-29-5, Iron Lithium Manganese oxide 138758-08-4,
Lithium Manganese phosphorus oxide 152325-75-2, Lead Lithium Manganese oxide 153327-00-5, Gallium Lithium Manganese oxide 153327-01-6, Germanium Lithium Manganese oxide 153327-04-9, Indium Lithium Manganese oxide 153327-05-0, Lithium Manganese Tin oxide 153327-06-1, Antimony Lithium Manganese oxide 153385-76-3, Arsenic Lithium Manganese oxide 153385-77-4, Lithium Manganese tellurium oxide 162684-16-4, Lithium Manganese Nickel oxide 173390-83-5, Lithium manganese oxide (Li_{1.08}Mn_{1.92}O₄) 173525-03-6, Lithium Manganese Sodium oxide 175786-46-6, Lithium Magnesium Manganese oxide 187156-09-8, Lithium Manganese Zinc oxide 191538-04-2, Copper Lithium Manganese oxide 201534-12-5, Lithium Manganese Zirconium oxide 204450-96-4, Chromium Lithium Manganese oxide 208394-04-1, Lithium Manganese Titanium oxide 208394-05-2, Lithium Manganese Molybdenum oxide 208394-06-3, Carbon Lithium Manganese oxide 245085-55-6, Calcium Lithium Manganese oxide 245085-56-7, Lithium Manganese Terbium oxide 252568-43-7, Lithium Manganese Tungsten oxide 252568-44-8, Lithium Manganese silicon oxide 273725-34-1, Lithium Manganese Potassium oxide 305365-08-6, Aluminum lithium manganese oxide (Al_{0.05}Li_{1.08}Mn_{1.87}O₄) 320425-32-9, Cerium Lithium Manganese oxide 320425-33-0, Bismuth Lithium Manganese oxide

(357308-23-7, Barium Lithium Manganese oxide 374079-61-5, Lithium Manganese Scandium oxide 374079-62-6, Lithium Manganese Strontium oxide 374079-63-7, Lanthanum Lithium Manganese oxide 374079-64-8, Lithium Manganese Yttrium oxide 393802-01-2, Beryllium lithium manganese oxide 393802-02-3, Lithium manganese selenium oxide 393802-03-4, Lithium manganese palladium oxide 393802-04-5, Lithium manganese silver oxide 393802-05-6, Cadmium lithium manganese oxide 393802-06-7, Lithium manganese tantalum oxide 393802-07-8, Lithium manganese niobium oxide 393802-08-9, Cesium lithium manganese oxide 393802-09-0, Lithium manganese neodymium oxide 393802-10-3, Lithium manganese samarium oxide 393802-11-4, Europium lithium manganese oxide
 (lithium manganate-type cathode active mass containing boron for secondary battery)

L20 ANSWER 15 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:745704 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 135:275419
 TITLE: Lithium batteries
 INVENTOR(S): Uemura, Toshihiko; Osaki, Makoto
 PATENT ASSIGNEE(S): Kyocera Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-----------------|
| JP 2001283913 | A | 20011012 | JP 2000-90975 | 20000329 --> |
| PRIORITY APPLN. INFO.: | | | JP 2000-90975 | 20000329 --> |

ED Entered STN: 12 Oct 2001

AB The batteries have a solid electrolyte between an electrode pair, where the electrode and/or separator contains a compound having a siloxane backbone and an aprotic solvent.

IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide

(solid electrolytes containing siloxanes and aprotic solvents for secondary lithium batteries)

RN 273943-45-6 HCAPLUS

CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

IC ICM H01M010-40
 ICS C08K003-22; C08K005-151; C08L083-04; H01M004-02; H01M004-58;
 H01M006-18

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery electrolyte electrode siloxane compd aprotic

solvent
 IT Secondary batteries
 (lithium; electrodes and solid electrolytes containing siloxanes and aprotic solvents for secondary lithium batteries)
 IT Polysiloxanes, uses
 (solid electrolytes containing siloxanes and aprotic solvents for secondary lithium batteries)
 IT 12031-92-4, Lithium manganese oxide (Li₄Mn5O₁₂)
 (anodes containing solid electrolyte and siloxanes and aprotic solvents for secondary lithium batteries)
 IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄)
 (cathodes containing solid electrolyte and siloxanes and aprotic solvents for secondary lithium batteries)
 IT 108-32-7, Propylene carbonate 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide
 (solid electrolytes containing siloxanes and aprotic solvents for secondary lithium batteries)

L20 ANSWER 16 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:485514 HCPLUS [Full-text](#)
 DOCUMENT NUMBER: 135:63870
 TITLE: Lithium batteries
 INVENTOR(S): Kamimura, Toshihiko; Osaki, Makoto; Mishima,
 Hiromitsu; Magome, Shinji; Hara, Toru; Kitahara,
 Nobuyuki; Higuchi, Ei
 PATENT ASSIGNEE(S): Kyocera Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| JP 2001185165 | A | 20010706 | JP 1999-365528 <-- | 19991222 |
| PRIORITY APPLN. INFO.: | | | JP 1999-365528 <-- | 19991222 |

ED Entered STN: 06 Jul 2001
 AB The batteries have an electrode pair, a solid electrolyte between the electrodes, and an acrylic polymer attached siloxane between the electrode active mass particles and the electrolyte particles. The siloxane may also contain RuO₂, Sb2O₃ doped SnO₂, or SnO₂ doped In2O₃.
 IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide
 (secondary lithium batteries containing acrylic siloxane layer between electrodes and solid electrolytes)
 RN 273943-45-6 HCPLUS
 CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

IC ICM H01M006-18
 ICS H01M010-36; H01M010-38; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT Polysiloxanes, uses
 (acrylic; secondary lithium batteries containing acrylic siloxane layer between electrodes and solid electrolytes)
 IT Secondary batteries
 (lithium; secondary lithium batteries containing acrylic siloxane layer between electrodes and solid electrolytes)
 IT Acrylic polymers, uses
 (polysiloxane; secondary lithium batteries containing acrylic siloxane layer between electrodes and solid electrolytes)
 IT Carbonaceous materials (technological products)
 (secondary lithium batteries with carbon containing acrylic siloxane layer between electrodes and solid electrolytes)
 IT 12031-92-4, Lithium manganese oxide (Li₄Mn₅O₁₂) 155472-68-7, Lithium manganese oxide (Li_{1.1}Mn_{1.9}O₄) 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide
 (secondary lithium batteries containing acrylic siloxane layer between electrodes and solid electrolytes)
 IT 12036-10-1, Ruthenium dioxide
 (secondary lithium batteries containing ruthenium oxide doped acrylic siloxane layer between electrodes and solid electrolytes)

L20 ANSWER 17 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:414797 HCPLUS Full-text

DOCUMENT NUMBER: 135:21943

TITLE: Lithium battery containing glass-ceramic solid electrolyte

INVENTOR(S): Uemura, Toshihiko; Osaki, Makoto; Mishima, Hiromitsu; Magome, Shinji; Hara, Toru; Kitahara, Nobuyuki; Higuchi, Hisashi

PATENT ASSIGNEE(S): Kyocera Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| JP 2001155777 | A | 20010608 | JP 1999-336716 | 19991126 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 1999-336716 | 19991126 |
| | | | <-- | |

ED Entered STN: 08 Jun 2001

AB The battery is equipped with a solid electrolyte layer sandwiched between a pair of electrodes, where the electrodes and the solid electrolyte contain a nonprotic solvent. Preferably, the solid electrolyte layer contains Li ion-conducting oxide-type glass ceramics. The battery has good electrochem. property and resistance to overvoltage.

IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide

(electrolyte; lithium battery containing glass-ceramic solid electrolyte and nonprotic solvent)

RN 273943-45-6 HCPLUS

CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|--------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

IC ICM H01M010-40

ICS H01M010-40; H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery glass ceramic solid electrolyte nonprotonic solvent

IT Battery electrolytes

(lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

IT Secondary batteries

(lithium; lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

IT 12031-92-4, Lithium manganese oxide (Li₄Mn₅O₁₂)

(anode; lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄)

(cathode; lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide

(electrolyte; lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7,

Propylene carbonate 110-71-4, 1,2-Dimethoxyethane 616-38-6,

Dimethyl carbonate

(solvent; lithium battery containing glass-ceramic solid electrolyte and nonprotonic solvent)

L20 ANSWER 18 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:414793 HCPLUS [Full-text](#)

DOCUMENT NUMBER: 135:35187

TITLE: Batteries comprising solid electrolytes sandwiched in between spinel-type lithium manganate cathodes and spinel-type lithium titanate anodes

INVENTOR(S): Hara, Toru; Kitahara, Nobuyuki; Uemura, Toshihiko; Mishima, Hiromitsu; Magome, Shinji; Osaki, Makoto; Higuchi, Hisashi

PATENT ASSIGNEE(S): Kyocera Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------------|----------|
| JP 2001155763 | A | 20010608 | JP 1999-336715 <-- | 19991126 |

PRIORITY APPLN. INFO.: JP 1999-336715 19991126

<--

ED Entered STN: 08 Jun 2001
 AB The batteries comprise solid electrolytes of (A) sintered materials of Li_2MnO_3 and $\text{Li}_{1+x+y}\text{MxTi}_{2-x}\text{Si}_y\text{P}_3-y\text{O}_{12}$ (I; M = Al or Ga; $x = 0-0.4$; $0 < y \leq 0.6$) on the cathode side and (B) sintered materials of Li_2TiO_3 and I on the anode side, sandwiched in between the electrodes and placed in an outer package. Such batteries with cathodes consisting of $\text{Li}_{1+x}\text{Mn}_{2-x}\text{O}_4$ ($x = 0.05-0.2$) or $\text{Li}_{1+x}\text{Ni}_{y}\text{Mn}_{2-x-y}\text{O}_4$ ($x = 0-0.2$; $0.4 \leq y < 0.6$) and anodes consisting of $\text{Li}_{1+x}\text{Ti}_{2-x}\text{O}_4$ ($x = 0.25-0.40$) are also claimed. Batteries with low surface resistance between the electrodes and the electrolytes are obtained. The batteries are suitable for use in personal digital assistance.

IT 343950-44-7
 (cathode-side electrolyte; batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium spinel oxide electrodes for use in personal digital assistances)

RN 343950-44-7 HCPLUS

CN Aluminum lithium manganese phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | | Ratio | | Component | |
|-----------|--|-------|--|-----------------|--|
| | | | | Registry Number | |
| O | | x | | 17778-80-2 | |
| P | | x | | 7723-14-0 | |
| Ti | | x | | 7440-32-6 | |
| Si | | x | | 7440-21-3 | |
| Mn | | x | | 7439-96-5 | |
| Li | | x | | 7439-93-2 | |
| Al | | x | | 7429-90-5 | |

IC ICM H01M010-36

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 57

ST lithium titanium phosphate silicate battery electrolyte; spinel lithium oxide electrode battery electrolyte; personal digital assistance solid electrolyte battery

IT Battery anodes

Battery cathodes

Battery electrolytes

Solid state secondary batteries

(batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium spinel oxide electrodes for use in personal digital assistances)

IT 123921-35-7, Lithium titanium oxide (Lil.33Til.6704) 343950-34-5, Lithium titanium oxide (Lil.25-1.4Til.6-1.7504)

(anode; batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium spinel oxide electrodes for use in personal digital assistances)

IT 343950-44-7
 (cathode-side electrolyte; batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium spinel oxide electrodes for use in personal digital assistances)

IT 155472-68-7, Lithium manganese oxide (Lil.1Mn1.904) 335638-14-7,

Lithium manganese oxide (Lil.05-1.2Mn1.8-1.9504) 343950-32-3,

Lithium manganese nickel oxide (Lil-1.2Mn0.4-0.6Ni0.2-0.604)

(cathode; batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium

- spinel oxide electrodes for use in personal digital assistances)
 IT 12031-82-2, Lithium titanium oxide (Li₂TiO₃)
 (electrolyte on anode side containing; batteries comprising
 lithium titanium phosphate silicate electrolytes showing
 low surface resistances with lithium spinel oxide electrodes for
 use in personal digital assistances)
- IT 12163-00-7, Lithium manganese oxide (Li₂MnO₃)
 (electrolyte on cathode side containing; batteries comprising
 lithium titanium phosphate silicate electrolytes showing
 low surface resistances with lithium spinel oxide electrodes for
 use in personal digital assistances)
- IT 343950-37-8 343950-39-0 343950-42-5
 (electrolyte; batteries comprising lithium titanium
 phosphate silicate electrolytes showing low surface
 resistances with lithium spinel oxide electrodes for use in
 personal digital assistances)

L20 ANSWER 19 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:336754 HCPLUS Full-text
 DOCUMENT NUMBER: 1341:342526
 TITLE: Secondary lithium battery having modified
 interfacial layer between electrode and
 electrolyte layers
 INVENTOR(S): Osaki, Makoto; Kamimura, Toshihiko; Higuchi, Ei;
 Kitahara, Nobuyuki; Hara, Toru; Mishima,
 Hiromitsu; Magome, Shinji
 PATENT ASSIGNEE(S): Kyocera Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-----------------|
| JP 2001126758 | A | 20010511 | JP 1999-307149 | 19991028 --> |
| PRIORITY APPLN. INFO.: | | | JP 1999-307149 | 19991028 --> |

ED Entered STN: 11 May 2001
 AB The battery using low-m.p. glasses as binders has a mixed layer containing
 active material powders, solid electrolyte powders, and low-m.p. glass binders
 between electrode and solid electrolyte layers. The battery showed high
 discharge capacity.
 IT 273943-45-6, Aluminum lithium phosphorus silicon titanium
 oxide
 (solid electrolyte; secondary lithium battery having
 modified interfacial layer between electrode and
 electrolyte layers)
 RN 273943-45-6 HCPLUS
 CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component | Registry Number |
|-----------|-------|-----------|-----------------|
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Ti | x | | 7440-32-6 |
| Si | x | | 7440-21-3 |

| | | | | |
|----|--|---|--|-----------|
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

IC ICM H01M010-38
ICS H01M004-02; H01M004-58; H01M010-36
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery interfacial layer electrode electrolyte;
glass binder lithium battery discharge capacity
IT Aluminoborosilicate glasses
 (lithium zinc, binder; secondary lithium battery having modified
 interfacial layer between electrode and electrolyte
 layers)
IT Secondary batteries
 (lithium; secondary lithium battery having modified interfacial
 layer between electrode and electrolyte layers)
IT 12031-92-4P, Lithium manganese oxide (Li₄Mn₅O₁₂)
 (anode active material; secondary lithium battery having modified
 interfacial layer between electrode and electrolyte
 layers)
IT 155472-68-7P, Lithium manganese oxide (Li_{1.1}Mn_{1.9}O₄)
 (cathode active material; secondary lithium battery having modified
 interfacial layer between electrode and electrolyte
 layers)
IT 273943-45-6, Aluminum lithium phosphorus silicon titanium
oxide
 (solid electrolyte; secondary lithium battery having
 modified interfacial layer between electrode and
 electrolyte layers)

L20 ANSWER 20 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:336740 HCPLUS Full-text

ACCESSION NUMBER: 2001:33674
DOCUMENT NUMBER: 134:342514

DOCUMENT NUMBER: 154-542514
TITLE: Lithium batteries with electrodes showing strong adhesion with solid electrolytes

INVENTOR(S): Kamimura, Toshihiko; Osaki, Makoto; Mishima, Hiromitsu; Magome, Shinji; Hara, Toru; Kitahara, Nobuyuki; Hisanobu, Ei

PATENT ASSIGNEE(S): Kyocera Corp., Japan

PATENT ASSIGNEE(S): Kyocera Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

SOURCE: **SPN: ROKAI 10**
CODEN: **JKXXXAF**

DOCUMENT TYPE: Patent

DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC NUM COUNT: 1

FAMILY ACC. NUM. CO
PATENT INFORMATION:

PATIENT INFORMATION:

PATENT NO. _____

TR-2001136740

PRIORITY APPLN. INFO.: JP 1999-303054 19991025
<--
<--

ED Entered STN: 11 May 2001

AB The batteries comprise (a) electrodes containing compds. having siloxane backbones filled in spaces in between the active material powder and (b) solid electrolytes consisting of sintered Li ion-conducting crystallized glass. The siloxane compound may contain RuO₂, Sb203-doped SnO₂, or SnO₂-doped In203. Batteries with excellent charge-discharge characteristics are obtained.

IT Batteries with excellent charge-discharge characteristics are obtained.
273943-45-6
(electrolyte); lithium batteries comprising of Li
ion-conductive crystallized glass electrolytes and electrodes

comprising of siloxane-containing binders)
 RN 273943-45-6 HCAPLUS
 CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|---|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |
| IC | ICM H01M006-18 | |
| | ICS H01M004-62; H01M010-36 | |
| CC | 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) | |
| | Section cross-reference(s): 57 | |
| ST | lithium battery electrode siloxane binder; sintered glass solid electrolyte battery | |
| IT | Battery electrodes | |
| | Battery electrolytes | |
| | (lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | Glass ceramics | |
| | (lithium ion-conducting; lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | Ionic conductors | |
| | Secondary batteries | |
| | (lithium; lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | 7631-86-9P, Silica, uses | |
| | (electrode binder; lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | 273943-45-6 | |
| | (electrolyte; lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | 1309-64-4, Antimony oxide (Sb2O3), uses 1312-43-2, Indium oxide (In2O3) 12036-10-1, Ruthenium oxide (RuO2) 12673-86-8, Antimony tin oxide 18282-10-5, Tin dioxide 50926-11-9, ITO | |
| | (lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |
| IT | 681-84-5, Tetramethoxysilane | |
| | (lithium batteries comprising of Li ion-conductive crystallized glass electrolytes and electrodes comprising of siloxane-containing binders) | |

L20 ANSWER 21 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:242930 HCAPLUS Full-text

DOCUMENT NUMBER: 134:268766

TITLE: Lithium battery with improved interfacial structure between electrode and electrolyte

INVENTOR(S): Kamimura, Toshihiko; Osaki, Makoto; Mishima,

Hiromitsu; Magome, Shinji; Hara, Akira; Kitahara,
 Nobuyuki; Higuchi, Hisashi
PATENT ASSIGNEE(S): Kyocera Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-----------------|
| JP 2001093536 | A | 20010406 | JP 1999-275355 | 19990928 --> |
| PRIORITY APPLN. INFO.: | | | JP 1999-275355 | 19990928 --> |

- ED Entered STN: 06 Apr 2001
 AB In the battery comprising a solid electrolyte sandwiched between a pair of cathode and anode, the solid electrolyte is obtained by firing mixts. of Li-, Ti-, and P-containing crystalline solid electrolyte powders, Ti oxide, and Li compds. The battery shows reduced grain boundary resistivity in the electrolyte, reduced interfacial resistivity between electrodes and the electrolyte, and good charge-discharge performance.
 IT 332010-94-3P, Lithium phosphorus titanium oxide
 (solid electrolyte; lithium battery with improved interfacial structure between electrode and electrolyte)
 RN 332010-94-3 HCPLUS
 CN Lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | Ratio | Component | Registry Number |
|-----------|-------|-----------|-----------------|
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Ti | x | | 7440-32-6 |
| Li | x | | 7439-93-2 |

- IC ICM H01M006-18
 ICS H01M004-58; H01M010-36
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium solid electrolyte battery interfacial structure;
 titania lithium hydroxide solid electrolyte firing
 IT Solid state secondary batteries
 (lithium battery with improved interfacial structure between
 electrode and electrolyte)
 IT Secondary batteries
 (lithium; lithium battery with improved interfacial structure
 between electrode and electrolyte)
 IT 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂)
 (anode; lithium battery with improved interfacial structure between
 electrode and electrolyte)
 IT 12031-92-4P, Lithium manganese oxide (Li₄Mn₅O₁₂)
 (anode; lithium battery with improved interfacial structure between
 electrode and electrolyte)
 IT 155472-68-7P, Lithium manganese oxide (Li_{1.1}Mn_{1.9}O₄)
 (cathode; lithium battery with improved interfacial structure
 between electrode and electrolyte)
 IT 1310-65-2, Lithium hydroxide 13463-67-7, Titania, uses
 (lithium battery with improved interfacial structure between
 electrode and electrolyte)

IT 30622-39-0, Lithium titanium phosphate [LiTi₂(PO₄)₃]
 (lithium battery with improved interfacial structure between
 electrode and electrolyte)
 IT 332010-94-3P, Lithium phosphorus titanium oxide
 (solid electrolyte; lithium battery with improved
 interfacial structure between electrode and electrolyte)

L20 ANSWER 22 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:242929 HCAPLUS Full-text

DOCUMENT NUMBER: 134:268765

TITLE: Solid electrolyte battery with improved
 interfacial structure between electrolyte
 and electrode

INVENTOR(S): Kamimura, Toshihiko; Osaki, Makoto; Mishima,
 Hiromitsu; Magome, Shinji; Hara, Akira; Kitahara,
 Nobuyuki; Higuchi, Hisashi

PATENT ASSIGNEE(S): Kyocera Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------------|----------|
| JP 2001093535 | A | 20010406 | JP 1999-275354 <-- | 19990928 |
| PRIORITY APPLN. INFO.: | | | JP 1999-275354 <-- | 19990928 |

ED Entered STN: 06 Apr 2001

AB In the battery comprising a solid electrolyte sandwiched between a pair of cathode and anode composed transition metal element-containing active material, the transition metals in the cathode and anode active materials are dispersed in the solid electrolyte at the cathode and anode side, resp. The battery showed reduced internal resistivity and good charge-discharge performance.

IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide

(solid electrolyte; solid electrolyte battery
 with improved interfacial structure between electrolyte
 and electrode)

RN 273943-45-6 HCAPLUS

CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

IC ICM H01M006-18

ICS H01M004-58; H01M010-36

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST solid battery interfacial structure electrolyte electrode;
 transition metal dispersion electrolyte solid battery

- IT Secondary batteries
 (lithium; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT Solid state secondary batteries
 (solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂)
 (anode; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT 12031-92-4P, Lithium manganese oxide (Li₄Mn₅O₁₂)
 (anode; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT 155472-68-7P, Lithium manganese oxide (Li_{1.1}Mn_{1.9}O₄)
 (cathode; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT 7439-96-5, Manganese, processes
 (dispersion into electrolyte; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)
- IT 273943-45-6, Aluminum lithium phosphorus silicon titanium oxide
 (solid electrolyte; solid electrolyte battery with improved interfacial structure between electrolyte and electrode)

L20 ANSWER 23 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:133981 HCPLUS Full-text
 DOCUMENT NUMBER: 134:181061
 TITLE: Secondary lithium battery with cathode containing lithium manganese mixed oxide
 INVENTOR(S): Yoshimura, Seiji; Ota, Taeko; Fujitani, Noboru; Nishiguchi, Nobuhiko
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------------|----------|
| JP 2001052698 | A | 20010223 | JP 1999-220597 <-- | 19990804 |
| JP 3639468 | B2 | 20050420 | | |
| US 6461770 | B1 | 20021008 | US 2000-630675 <-- | 20000801 |

PRIORITY APPLN. INFO.: JP 1999-220597 A 19990804
 <--

ED Entered STN: 23 Feb 2001

AB The battery is equipped with a cathode active mass containing a Li Mn mixed oxide containing B and P. Preferably, the cathode uses a Li Mn mixed oxide manufactured from a mixture having atomic ratio of B:P:Li:Mn = 0.01-0.20:0.01-0.10:0.1-2.0:1 by heating under O. The cathode active mass is suppressed from reaction with an electrolyte solution and resulting battery has long cycle life.

IT 326851-29-0P, Boron lithium manganese phosphorus oxide
 (lithium manganese mixed oxide containing boron and phosphorus in cathode for battery)

RN 326851-29-0 HCPLUS

CN Boron lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| B | x | 7440-42-8 |
| Mn | x | 7439-96-5 |
| Li | x | 7439-93-2 |

IC ICM H01M004-58
 ICS H01M004-02; H01M004-40; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132404-42-3, Lithium tris(trifluoromethanesulfonyl)methide 132843-44-8, Lithium bis(pentafluoroethanesulfonyl)imide (electrolyte; lithium manganese mixed oxide containing boron and phosphorus in cathode for battery)
 IT 326851-23-0P, Boron lithium manganese phosphorus oxide (lithium manganese mixed oxide containing boron and phosphorus in cathode for battery)

L20 ANSWER 24 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:774123 HCPLUS Full-text
 DOCUMENT NUMBER: 133:352634
 TITLE: Electrode materials having increased surface conductivity
 INVENTOR(S): Ravet, Nathalie; Besner, Simon; Simoneau, Martin; Vallee, Alain; Armand, Michel; Magnan, Jean-francois
 PATENT ASSIGNEE(S): Hydro-Quebec, Can.
 SOURCE: Eur. Pat. Appl., 22 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: French
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|--|----------|-----------------|-----------------|
| EP 1049182 | A2 | 20001102 | EP 2000-401207 | 20000502 <-- |
| EP 1049182 | A3 | 20040211 | | |
| EP 1049182 | B1 | 20080102 | | |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO | | | |
| CA 2270771 | A1 | 20001030 | CA 1999-2270771 | 19990430 <-- |
| CA 2307119 | A1 | 20001030 | CA 2000-2307119 | 20000428 <-- |
| CA 2625896 | A1 | 20001030 | CA 2000-2625896 | 20000428 <-- |
| JP 2001015111 | A | 20010119 | JP 2000-132779 | 20000501 <-- |
| EP 1796189 | A2 | 20070613 | EP 2007-4289 | 20000502 <-- |
| EP 1796189 | A3 | 20070620 | | |

| | | | | |
|------------------------|----|----------|-----------------|-------------|
| R: DE, FR, GB, IT | | | | |
| US 20020195591 | A1 | 20021226 | US 2002-175794 | 20020621 |
| | | | <-- | |
| US 6855273 | B2 | 20050215 | | |
| US 20040140458 | A1 | 20040722 | US 2003-740449 | 20031222 |
| | | | <-- | |
| US 6962666 | B2 | 20051108 | | |
| US 20060060827 | A1 | 20060323 | US 2005-266339 | 20051104 |
| | | | <-- | |
| US 7344659 | B2 | 20080318 | JP 2008-41303 | 20080222 |
| JP 2008186807 | A | 20080814 | | |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | CA 1999-2270771 | A 19990430 |
| | | | <-- | |
| | | | CA 2000-2307119 | A3 20000428 |
| | | | <-- | |
| | | | US 2000-560572 | B1 20000428 |
| | | | <-- | |
| | | | JP 2000-132779 | A3 20000501 |
| | | | <-- | |
| | | | EP 2000-401207 | A3 20000502 |
| | | | <-- | |
| | | | US 2002-175794 | A3 20020621 |
| | | | <-- | |
| | | | US 2003-740449 | A1 20031222 |
| | | | <-- | |

ED Entered STN: 05 Nov 2000

AB Intercalated electrode materials comprising complex oxides, especially Li oxides, are prepared, suitable for redox reaction by exchange of alkali metal ions (especially Li) and electrons with an electrolyte. The complex oxide electrodes can be used in batteries, supercapacitors or electrochromic light moderators. The complex oxides have the general formula AaMmZzOoNnFf, where A is alkali metal (e.g., Li), M is ≥1 transition metal (e.g., Fe, Mn, V, Ti, Mo, Nb, Zn, W), Z is ≥1 nonmetal (e.g., P, S, Si, Se, As, Ge, B, Sn), and a,m,z,o,n,f are chosen for elec. neutrality. A conductive carbon coating is formed or deposited on the surface of the electrode material, e.g., by pyrolysis of an organic material, hydrocarbons or polymers, for increased surface conductivity

IT 304905-36-0P, Iron lithium phosphorus silicon oxide
 304905-37-1P 304905-38-2P, Iron lithium phosphorus fluoride oxide 304905-39-3P 304905-40-6P
 304905-41-7P 304905-42-8P

(electrode materials having increased surface conductivity)

RN 304905-36-0 HCPLUS

CN Iron lithium phosphorus silicon oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| <hr/> | | |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Fe | x | 7439-89-6 |

RN 304905-37-1 HCPLUS

CN Lithium manganese phosphorus silicon oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |

| | | | | |
|----|--|---|--|------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Si | | x | | 7440-21-3 |
| Mn | | x | | 7439-96-5 |
| Li | | x | | 7439-93-2 |

RN 304905-38-2 HCPLUS
CN Iron lithium phosphorus fluoride oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|--------------------------------|
| O | | x | | 17778-80-2 |
| F | | x | | 14762-94-8 |
| P | | x | | 7723-14-0 |
| Li | | x | | 7439-93-2 |
| Fe | | x | | 7439-89-6 |

RN 304905-39-3 HCPLUS
CN Lithium manganese phosphorus silicon fluoride oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|--------------------------------|
| O | | x | | 17778-80-2 |
| F | | x | | 14762-94-8 |
| P | | x | | 7723-14-0 |
| Si | | x | | 7440-21-3 |
| Mn | | x | | 7439-96-5 |
| Li | | x | | 7439-93-2 |

RN 304905-40-6 HCPLUS
CN Iron lithium phosphorus silicon sulfur oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|--------------------------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| S | | x | | 7704-34-9 |
| Si | | x | | 7440-21-3 |
| Li | | x | | 7439-93-2 |
| Fe | | x | | 7439-89-6 |

RN 304905-41-7 HCPLUS
CN Lithium manganese phosphorus silicon sulfur oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|--------------------------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| S | | x | | 7704-34-9 |
| Si | | x | | 7440-21-3 |
| Mn | | x | | 7439-96-5 |
| Li | | x | | 7439-93-2 |

RN 304905-42-8 HCPLUS
CN Iron lithium phosphorus silicon sulfur titanium vanadium oxide (CA

INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|---|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| S | x | 7704-34-9 |
| V | x | 7440-62-2 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Fe | x | 7439-89-6 |
| IC | ICM H01M004-58 | |
| | ICS H01M004-48; H01M004-62 | |
| CC | 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) | |
| | Section cross-reference(s): 57, 72, 76 | |
| IT | Polyoxyalkylenes, uses (electrolytes; electrode materials having increased surface conductivity) | |
| IT | Electrolytic capacitors (supercapacitors; electrode materials having increased surface conductivity) | |
| IT | 7440-44-0F, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiP04) 30734-08-8P, Lithium manganese silicate Li2MnSiO4 39302-37-9P, Lithium titanium oxide 180984-63-8P, Lithium magnesium titanium oxide 252943-50-3P, Lithium vanadium phosphate silicate Li3.5V2(P04)2.5(SiO4)0.5 304905-30-4P 304905-31-5P, Iron lithium fluoride (FeLi0.2F3) 304905-32-6P, Lithium manganese nitride oxide (Li3MnN0) 304905-33-7P 304905-34-8P 304905-35-9P, Lithium magnesium titanium oxide (Li3.5Mg0.5Ti4012) 304905-36-0P, Iron lithium phosphorus silicon oxide 304905-37-1P 304905-38-2P, Iron lithium phosphorus fluoride oxide 304905-39-3P 304905-40-6P 304905-41-7P 304905-42-8P (electrode materials having increased surface conductivity) | |
| IT | 75-05-8, Acetonitrile, uses 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 110-71-4 616-38-6, Dimethyl carbonate 646-06-0, Dioxolane 2832-49-7, Tetraethylsulfamide 21324-40-3, Lithium hexafluorophosphate LiPF6 25322-68-3 66950-70-7 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide (electrolytes; electrode materials having increased surface conductivity) | |

L20 ANSWER 25 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:418149 HCPLUS Full-text
 DOCUMENT NUMBER: 133:32679
 TITLE: Secondary polymer electrolyte lithium
 batteries
 INVENTOR(S): Kaburagi, Kimiaki; Kimishima, Takahiro
 PATENT ASSIGNEE(S): Toshiba Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|------|-----------------|------|
|------------|------|------|-----------------|------|

JP 2000173654 A 20000623 JP 1998-345561 19981204

PRIORITY APPLN. INFO.: JP 1998-345561 19981204
 ED Entered STN: 23 Jun 2000
 AB The batteries have an electrolyte layer containing an electrolyte solution retaining polymer and a Li⁺ conductive glass ceramic. The glass ceramic is preferably $\text{Li}_{1+x}(\text{Al},\text{Ga})_x\text{Ti}_2-x\text{P}_3\text{O}_12$ ($x \leq 0.3$), $\text{Li}_{1+x+y}\text{Al}_x\text{Ti}_{2-x}\text{Si}_y\text{P}_3-y\text{O}_12$ ($y \leq 0.1$), or $\text{Li}_{1+z}\text{Al}_z\text{Ge}_2-z\text{P}_3\text{O}_12$ ($z \leq 0.2$).
 IT 273943-45-6
 (polymer electrolyte containing lithium ion conductive glass ceramic for secondary lithium batteries)
 RN 273943-45-6 HCAPLUS
 CN Aluminum lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------|-----------------|
| | | | Registry Number |
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Ti | x | | 7440-32-6 |
| Si | x | | 7440-21-3 |
| Li | x | | 7439-93-2 |
| Al | x | | 7429-90-5 |

IC ICM H01M010-40
 ICS C03C010-12
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery polymer glass ceramic electrolyte; lithium aluminum gallium titanium phosphate battery electrolyte; germanium lithium aluminum phosphate battery electrolyte; silicon lithium aluminum gallium titanium phosphate electrolyte
 IT Battery electrolytes
 (polymer electrolyte containing lithium ion conductive glass ceramic for secondary lithium batteries)
 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate
 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 21324-40-3, Lithium hexafluorophosphate 273943-44-5
 273943-45-6 273943-46-7, Aluminum germanium lithium phosphate (A10-0.2Ge1.8-2Li1-1.2(Po4)3)
 (polymer electrolyte containing lithium ion conductive glass ceramic for secondary lithium batteries)

L20 ANSWER 26 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:362749 HCAPLUS Full-text
 DOCUMENT NUMBER: 132:350261
 TITLE: Battery electrodes containing porous polymer electrolytes and nonaqueous-electrolyte secondary batteries using them
 INVENTOR(S): Segawa, Masazumi
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|---|--------------------------------|-----------------------|----------|
| JP 2000149926 | A | 20000530 | JP 1998-327488 <-- | 19981102 |
| PRIORITY APPLN. INFO.: | | | JP 1998-327488 <-- | 19981102 |
| ED | Entered STN: 31 May 2000 | | | |
| AB | The title electrode contains spinel $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$ ($\text{M} = \text{metal, F, P, B; } x = 0-0.5$), which are manufactured by immersing polymer solution-containing electrodes in (water-containing) alcs. The nonaqueous-electrolyte secondary battery uses the electrodes as the cathodes. | | | |
| IT | 195881-00-6, Lithium nickel phosphorus oxide (porous polymer electrolyte-containing Li Ni oxide for secondary Li battery cathode) | | | |
| RN | 195881-00-6 HCAPLUS | | | |
| CN | Lithium nickel phosphorus oxide (CA INDEX NAME) | | | |
| Component | Ratio | Component Registry Number | | |
| O | x | 17778-80-2 | | |
| P | x | 7723-14-0 | | |
| Ni | x | 7440-02-0 | | |
| Li | x | 7439-93-2 | | |
| IC | ICM H01M004-02 ICS H01M004-04; H01M004-58; H01M004-62; H01M010-40 | | | |
| CC | 52-2 (Electrochemical, Radiational, and Thermal Energy Technology) | | | |
| ST | lithium nickel oxide battery cathode; polymer electrolyte porous lithium battery | | | |
| IT | Secondary batteries (lithium; porous polymer electrolyte-containing Li Ni oxide for secondary Li battery cathode) | | | |
| IT | Battery cathodes Battery electrolytes Polymer electrolytes (porous polymer electrolyte-containing Li Ni oxide for secondary Li battery cathode) | | | |
| IT | 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer (porous polymer electrolyte-containing Li Ni oxide for secondary Li battery cathode) | | | |
| IT | 12031-65-1, Lithium nickel oxide (LiNiO_2) 39336-10-2, Iron lithium nickel oxide 131344-56-4, Cobalt lithium nickel oxide 152991-98-5, Aluminum lithium nickel oxide 162684-16-4, Lithium manganese nickel oxide 191538-05-3, Copper lithium nickel oxide 195881-00-6 , Lithium nickel phosphorus oxide 249756-69-2, Boron lithium nickel oxide 267009-80-3, Lithium nickel fluoride oxide (porous polymer electrolyte-containing Li Ni oxide for secondary Li battery cathode) | | | |
| L20 | ANSWER 27 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN ACCESSION NUMBER: 2000:248360 HCAPLUS Full-text DOCUMENT NUMBER: 132:267531 TITLE: Inorganic-organic composite solid polymer electrolytes AUTHOR(S): Abraham, K. M.; Koch, V. R.; Blakley, T. J. CORPORATE SOURCE: Covalet Associates, Incorporated, Woburn, MA, 01801, USA SOURCE: Journal of the Electrochemical Society (2000), 147(4), 1251-1256 | | | |

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

ED Entered STN: 19 Apr 2000

AB Inorg.-organic composite solid polymer electrolytes (CSPEs) have been prepared from the poly(ethylene oxide) (PEO)-like electrolytes of the general formula polyvinylidene fluoride-hexafluoropropylene (PVDF-HFP)-PEOn-LiX and Li⁺-conducting ceramic powders. In the PEO-like electrolytes, PVDF-HFP is the copolymer of PVDF and HFP, PEOn is a nonvolatile oligomeric polyethylene oxide of .apprx.400 g/mol mol. weight, and LiX is lithium bis(trifluoroethylsulfonyl) imide. Two types of inorg. oxide ceramic powders were used: a highly Li⁺-conducting material of the composition 14 mol % Li₂₀-9Al₂₀₃-38TiO₂-39P₂O₅, and the poorly Li⁺-conducting Li-silicates Li_{4-x}M_xSiO₄ where M = Ca or Mg and x is 0 or 0.05. The composite electrolytes can be prepared as thin membranes in which the Li⁺ conductivity and good mech. strength of the Li⁺-conducting inorg. ceramics are complemented by the structural flexibility and high conductivity of organic polymer electrolytes. Excellent electrochem. and thermal stabilities have been demonstrated for the electrolyte films. Li//composite electrolyte //LiCoO₂ rechargeable cells have been fabricated and cycled at room temperature and 50°C.

IT 186088-00-6, Aluminum lithium phosphorus titanium oxide
(inorg.-organic composite solid polymer electrolytes for

lithium batteries)

RN 186088-00-6 HCAPLUS

CN Aluminum lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|---------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ti | x | 7440-32-6 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38, 57, 72

ST Section cross reference(s). 30, 37, 72
solid polymer composite electrolyte lithium battery;
polyethylene oxide vinylidene fluoride hexafluoropropylene copolymer;
ceramic powder lithium conducting electrolyte; lithium
calcium magnesium silicate electrolyte

IT Ionic conductivity

(inorganic-organic composite solid polymer electrolytes for lithium batteries)

IT Polyoxyalkylenes, uses

(inorg.-organic composite solid polymer electrolytes for lithium batteries)

IT 1344-28-1, Alumina, uses 12057-24-8, Lithium oxide, uses

3463-67-7, Titania, uses
(ceramic material containing; inorg.-organic composite solid polymer
electrolytes for lithium batteries)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

3453-84-4, Lithium silicate 13453-84-4D, calcium doped
 3453-84-4D, magnesium doped 25322-68-3 132843-44-8, Lithium
 bis(pentafluoroethylsulfonyl)imide 186088-60-6, Aluminum
 lithium phosphorus titanium oxide

(inorg.-organic composite solid polymer electrolytes for lithium batteries)

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR

THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L20 ANSWER 28 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1999:471937 HCAPLUS Full-text
 DOCUMENT NUMBER: 131:124675
 TITLE: Carbon dioxide gas sensor
 INVENTOR(S): Chou, Ekisan; Chiba, Kazunori; Tagawa, Hiroaki;
 Mizusaki, Junichiro
 PATENT ASSIGNEE(S): Akebono Brake Research and Development Center,
 Ltd., Japan; Foundation for Scientific Technology
 Promotion
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|---------------------|----------|
| JP 11201937 | A | 19990730 | JP 1998-4053 --> | 19980112 |
| JP 3984347 | B2 | 20071003 | JP 1998-4053 --> | 19980112 |

PRIORITY APPLN. INFO.:

ED Entered STN: 02 Aug 1999
 AB The title sensor is characterized by having miniature size, stable sensor emf with time, and good detection precision. The sensor comprises a solid electrolyte substrate made of alkali or alkaline earth metal ion conductive oxide, a working electrode which maintains a dissociation equilibrium with CO₂, and a solid standard electrode. The solid standard electrode is made of a 2 phases mix. of transition metal oxide containing alkali or alkaline earth metal of same elec. conductivity with the solid electrolyte.
 IT 233598-60-2
 (solid electrolyte carbon dioxide gas sensor)
 RN 233598-60-2 HCAPLUS
 CN Aluminum lithium titanium metaphosphate oxide
 (Al_{0.16}Li_{0.27}Ti_{0.4}(PO₃)_{0.800.77}) (CA INDEX NAME)

| Component | Ratio | Component | Registry Number |
|------------------|-------|------------|-----------------|
| O | 0.77 | 17778-80-2 | |
| O ₃ P | 0.8 | 15389-19-2 | |
| Ti | 0.4 | 7440-32-6 | |
| Li | 0.27 | 7439-93-2 | |
| Al | 0.16 | 7429-90-5 | |

IC ICM G01N027-416
 ICS G01N027-406
 CC 79-2 (Inorganic Analytical Chemistry)
 Section cross-reference(s): 59, 72
 ST solid electrolyte carbon dioxide gas sensor
 IT Glass, uses
 (lithium; solid electrolyte carbon dioxide gas sensor)
 IT Air analysis
 Electrode reaction
 Gas analysis
 Solid electrolyte gas sensors

(solid electrolyte carbon dioxide gas sensor)
 IT Alkali metals, uses
 Alkaline earth metals
 Transition metal oxides
 (solid electrolyte carbon dioxide gas sensor)
 IT 124-38-9, Carbon dioxide, analysis
 (solid electrolyte carbon dioxide gas sensor)
 IT 554-13-2, Lithium carbonate 7439-89-6, Iron, uses 7439-93-2,
 Lithium, uses 7440-09-7, Potassium, uses 7440-23-5, Sodium, uses
 7440-24-6, Strontium, uses 7440-32-6, Titanium, uses 7440-33-7,
 Tungsten, uses 7440-39-3, Barium, uses 7440-47-3, Chromium, uses
 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium,
 uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses
 12022-46-7, Lithium iron oxide (LiFeO₂) 12023-70-0, Lithium iron
 oxide (LiFe₅O₈) 77641-62-4, Nasicon 233593-60-2
 (solid electrolyte carbon dioxide gas sensor)
 IT 10377-52-3 37220-89-6, Lithium aluminate
 (solid electrolyte carbon dioxide gas sensor)

L20 ANSWER 29 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:439828 HCAPLUS Full-text
 DOCUMENT NUMBER: 131:110621
 TITLE: Carbon dioxide gas sensor
 INVENTOR(S): Chang, Ki-Chan; Kobayashi, Shigeaki; Tagawa,
 Hiroaki; Mizusaki, Junichiro
 PATENT ASSIGNEE(S): Akebono Brake Research and Development Center,
 Ltd., Japan; Foundation for Scientific Technology
 Promotion
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| JP 11190718 | A | 19990713 | JP 1997-359198 | 19971226 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 1997-359198 | 19971226 |
| | | | <-- | |

ED Entered STN: 19 Jul 1999

AB The title sensor is characterized by having no time-dependent change of sensor electromotive force and is suited for precise determination of CO₂ concentration in gas samples. The sensor comprises a solid electrolyte substrate made of alkali metal ion conductive oxide, a working electrode made of metal carbonate which keeps a dissociation equilibrium with CO₂, and a standard solid electrode, made of non-stoichiometric transition metal oxides containing alkali metal of same elec. conductivity with the solid electrolyte.

IT 231950-35-9

(lithium glass; carbon dioxide gas sensor for environmental anal.)

RN 231950-35-9 HCAPLUS

CN Aluminum lithium titanium metaphosphate oxide
 (Al15.6Li26.6Ti40(PO₃)_{7.8076.8}) (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| ----- | ----- | ----- |
| O | 76.8 | 17778-80-2 |
| O3P | 79.8 | 15389-19-2 |

| | | | | |
|----|--|------|--|-----------|
| Ti | | 40 | | 7440-32-6 |
| Li | | 26.6 | | 7439-93-2 |
| Al | | 15.6 | | 7429-90-5 |

IC ICM G01N027-416
 ICS G01N027-406
 CC 79-2 (Inorganic Analytical Chemistry)
 Section cross-reference(s): 59, 72
 IT Air analysis
 Environmental analysis
 Gas analysis
 Solid electrolyte gas sensors
 (carbon dioxide gas sensor for environmental anal.)
 IT 231950-35-9
 (lithium glass; carbon dioxide gas sensor for environmental anal.)

L20 ANSWER 30 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1999:111963 HCAPLUS Full-text
 DOCUMENT NUMBER: 130:184881
 TITLE: Secondary nonaqueous-electrolyte lithium
 battery
 INVENTOR(S): Igawa, Akiko; Tsuruoka, Shigeo; Yoshikawa,
 Masanori; Muranaka, Yasushi
 PATENT ASSIGNEE(S): Hitachi, Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| ----- | --- | ----- | ----- | ----- |
| JP 11040153 | A | 19990212 | JP 1997-193612 | 19970718 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 1997-193612 | 19970718 |
| | | | <-- | |

ED Entered STN: 18 Feb 1999
 AB In the battery, an anode active mass comprises a C material containing an element which forms a compound with an alkali metal and an element which does not form a compound with an alkali metal, and a cathode active mass comprises AwPvNixMyNzO_2 ($\text{A} \geq 1$ alkali metal; $\text{P} = \text{Mg, B, P, and/or In}$; $\text{M} = \text{Mn, Co, and/or Al}$; $\text{N} = \text{Si, Al, Ca, Cu, Sn, Mo, Nb, Y, and/or Bi}$; $w = 0.05\text{-}1.2$; $v = 0.0001\text{-}0.2$; $x = 0.5\text{-}0.95$; $y = 0.005\text{-}0.5$; $z = 0\text{-}0.2$) and a mixture of graphite having $\text{Lc} \geq 150 \text{ \AA}$ and carbon black having sp. surface area $\geq 250 \text{ m}^2/\text{g}$ as elec. conductors. The elements in the C material may form intermetallic compds. or oxides. Decrease in overvoltage during discharge is prevented and the battery shows high-rate performance and has long service life.
 IT 177997-03-0, Cobalt lithium nickel phosphorus oxide
 220589-93-5 220589-94-6 220589-95-7
 220589-96-8 220589-97-9 220589-98-0
 220589-99-1 220590-00-1 220590-01-2
 220590-02-3 220590-03-4
 (Li battery having C material anode containing additive and mixed oxide cathode containing graphite/carbon black mixture)
 RN 177997-09-0 HCAPLUS
 CN Cobalt lithium nickel phosphorus oxide (CA INDEX NAME)

| | | | | |
|-----------|--|-------|--|-----------------|
| Component | | Ratio | | Component |
| | | | | Registry Number |

| | | | |
|----|---|--|------------|
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Co | x | | 7440-48-4 |
| Ni | x | | 7440-02-0 |
| Li | x | | 7439-93-2 |

RN 220589-93-5 HCPLUS

CN Aluminum cobalt lithium magnesium nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|------------|
| | | Registry Number | |
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Co | x | | 7440-48-4 |
| Ni | x | | 7440-02-0 |
| Mg | x | | 7439-95-4 |
| Li | x | | 7439-93-2 |
| Al | x | | 7429-90-5 |

RN 220589-94-6 HCPLUS

CN Cobalt lithium magnesium manganese nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|------------|
| | | Registry Number | |
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Co | x | | 7440-48-4 |
| Ni | x | | 7440-02-0 |
| Mn | x | | 7439-96-5 |
| Mg | x | | 7439-95-4 |
| Li | x | | 7439-93-2 |

RN 220589-95-7 HCPLUS

CN Aluminum cobalt lithium magnesium manganese nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|------------|
| | | Registry Number | |
| O | x | | 17778-80-2 |
| P | x | | 7723-14-0 |
| Co | x | | 7440-48-4 |
| Ni | x | | 7440-02-0 |
| Mn | x | | 7439-96-5 |
| Mg | x | | 7439-95-4 |
| Li | x | | 7439-93-2 |
| Al | x | | 7429-90-5 |

RN 220589-96-8 HCPLUS

CN Aluminum cobalt lithium magnesium manganese nickel phosphorus silicon oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|--|
| | | Registry Number | |

10/551,935

| | | | | |
|----|--|---|--|------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Co | | x | | 7440-48-4 |
| Si | | x | | 7440-21-3 |
| Ni | | x | | 7440-02-0 |
| Mn | | x | | 7439-96-5 |
| Mg | | x | | 7439-95-4 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 220589-97-9 HCPLUS

CN Aluminum calcium cobalt lithium magnesium manganese nickel phosphorus
oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|------------------------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Ca | | x | | 7440-70-2 |
| Co | | x | | 7440-48-4 |
| Ni | | x | | 7440-02-0 |
| Mn | | x | | 7439-96-5 |
| Mg | | x | | 7439-95-4 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 220589-98-0 HCPLUS

CN Aluminum cobalt copper lithium magnesium manganese nickel phosphorus
oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|------------------------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Cu | | x | | 7440-50-8 |
| Co | | x | | 7440-48-4 |
| Ni | | x | | 7440-02-0 |
| Mn | | x | | 7439-96-5 |
| Mg | | x | | 7439-95-4 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 220589-99-1 HCPLUS

CN Aluminum cobalt lithium magnesium manganese nickel phosphorus tin
oxide (CA INDEX NAME)

| Component | | Ratio | | Component Registry Number |
|-----------|--|-------|--|------------------------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Co | | x | | 7440-48-4 |
| Sn | | x | | 7440-31-5 |
| Ni | | x | | 7440-02-0 |
| Mn | | x | | 7439-96-5 |
| Mg | | x | | 7439-95-4 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 220590-00-1 HCAPLUS

CN Aluminum cobalt lithium magnesium manganese molybdenum nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Co | x | 7440-48-4 |
| Ni | x | 7440-02-0 |
| Mo | x | 7439-98-7 |
| Mn | x | 7439-96-5 |
| Mg | x | 7439-95-4 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

RN 220590-01-2 HCAPLUS

CN Aluminum cobalt lithium magnesium manganese nickel niobium phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Co | x | 7440-48-4 |
| Nb | x | 7440-03-1 |
| Ni | x | 7440-02-0 |
| Mn | x | 7439-96-5 |
| Mg | x | 7439-95-4 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

RN 220590-02-3 HCAPLUS

CN Aluminum cobalt lithium magnesium manganese nickel phosphorus yttrium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Y | x | 7440-65-5 |
| Co | x | 7440-48-4 |
| Ni | x | 7440-02-0 |
| Mn | x | 7439-96-5 |
| Mg | x | 7439-95-4 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

RN 220590-03-4 HCAPLUS

CN Aluminum bismuth cobalt lithium magnesium manganese nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | x | 17778-80-2 |

| | | | | |
|----|--|---|--|-----------|
| P | | x | | 7723-14-0 |
| Bi | | x | | 7440-69-9 |
| Co | | x | | 7440-48-4 |
| Ni | | x | | 7440-02-0 |
| Mn | | x | | 7439-96-5 |
| Mg | | x | | 7439-95-4 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

IC ICM H01M004-58

ICS H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 57, 76

ST mixed oxide cathode lithium battery; nonaq electrolyte
lithium battery; carbon material additive anode lithium battery;
graphite elec conductor cathode lithium battery; black carbon elec
conductor cathode batteryIT 177997-09-0, Cobalt lithium nickel phosphorus oxide
177997-12-5, Boron cobalt lithium nickel oxide 177997-14-7, Cobalt
indium lithium nickel oxide 180997-14-2, Cobalt lithium magnesium
nickel oxide 2070803-50-7, Aluminum cobalt lithium magnesium nickel
oxide 220589-93-5 220589-94-6 220589-95-7
220589-96-8 220589-97-9 220589-98-0
220589-99-1 220590-00-1 220590-01-2
220590-02-3 220590-03-4 220590-04-5 220590-05-6
220590-06-7 220590-07-8
(Li battery having C material anode containing additive and mixed oxide
cathode containing graphite/carbon black mixture)

L20 ANSWER 31 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:811852 HCAPLUS Full-text

DOCUMENT NUMBER: 130:98051

TITLE: Cathode materials and nonaqueous-
electrolyte secondary batteries using them

INVENTOR(S): Miura, Kaoru

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|------------|
| ----- | ---- | ----- | ----- | ----- |
| JP 10334914 | A | 19981218 | JP 1997-140594 | 19970529 |
| | | | <-- | |
| CN 1202743 | A | 19981223 | CN 1998-115268 | 19980527 |
| | | | <-- | |
| CN 1123942 | C | 20031008 | | |
| US 6093505 | A | 20000725 | US 1998-85110 | 19980528 |
| | | | <-- | |
| PRIORITY APPLN. INFO.: | | | JP 1997-140594 | A 19970529 |
| | | | <-- | |

ED Entered STN: 30 Dec 1998

AB The title cathode materials are manufactured from $\text{Li}_x\text{Mn}_2\text{O}_4$ ($x = 0-3$) in which
a part of O is substituted by anion having larger absolute value than O.
Nonaq.-electrolyte secondary batteries using cathodes from the materials are
also claimed. The batteries have high capacity.IT 219527-66-9P, Lithium manganese oxide phosphide ($\text{LiMn}_2\text{O}_2\text{P}_2$)

(cathodes from anion-containing Li Mn oxide for secondary battery)
 RN 219527-66-9 HCAPLUS
 CN Lithium manganese oxide phosphide (LiMn2O2P2) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|-------|------------------------------|
| O | 2 | 17778-80-2 |
| P | 2 | 7723-14-0 |
| Mn | 2 | 7439-96-5 |
| Li | 1 | 7439-93-2 |

IC ICM H01M004-58
 ICS C01G045-00; H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 219527-65-8P, Lithium manganese nitride oxide (LiMn2N2O)
 219527-66-9P, Lithium manganese oxide phosphide (LiMn2O2P2)
 (cathodes from anion-containing Li Mn oxide for secondary battery)

L20 ANSWER 32 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1998:238170 HCAPLUS Full-text
 DOCUMENT NUMBER: 128:277451
 ORIGINAL REFERENCE NO.: 128:54795a,54798a
 TITLE: Effect of Ti doping on the ionic conductivity of
 Li₃PO₄-xNx thin film
 AUTHOR(S): Lee, J. H.; Lee, Y. K.; Park, J. W.
 CORPORATE SOURCE: Dept. of Metallurgical Engineering, Hanyang
 University, Seoul, 133-791, S. Korea
 SOURCE: Han'guk Pyomyon Konghak Hoechi (1997),
 30(4), 255-261
 CODEN: HKHEL; ISSN: 1225-8024
 PUBLISHER: Korean Institute of Surface Engineering
 DOCUMENT TYPE: Journal
 LANGUAGE: Korean
 ED Entered STN: 27 Apr 1998
 AB Thin film batteries can be used as a micro power source for electronic devices
 in which minute power is needed. Li phosphorous oxynitride (LIPON) thin films
 were deposited as an electrolyte for Li ion batteries using RF magnetron
 sputtering of Li phosphate in N₂. Ti was also added into the LIPON films as a
 2nd network former to enhance the ionic conductivity of the films. The
 optimum conditions for LIPON film deposition were sought and the electrolyte
 with the conductivity of 2.5 + 10⁻⁶ S/cm was obtained at the condition of RF
 power 4.4 W/cm², process pressure 10 mtorr and pure N₂ ambience. Also, the
 conductivity of LIPON films was increased from 2.5 + 10⁻⁶ S/cm to 8.6 + 10⁻⁶
 S/cm by the doping of 2.4 atomic% Ti. Also by adding Ti to LIPON films, Li
 content was increased and N content that reported having the crosslinking
 effect on LIPON films was also increased as confirmed by XPS.
 IT 205496-31-7P, Lithium titanium nitrate oxide phosphide
 (Li_{0.87}Ti_{0.07}(NO₃)_{0.18}O_{0.6}P)
 (ionic conductivity of sputtered titanium-doped lithium phosphorous
 oxynitride films for lithium ion batteries)
 RN 205496-31-7 HCAPLUS
 CN Lithium titanium nitrate oxide phosphide (Li_{0.87}Ti_{0.07}(NO₃)_{0.18}O_{0.6}P)
 (9CI) (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------------|-------|------------------------------|
| O | 0.6 | 17778-80-2 |
| NO ₃ | 0.18 | 14797-55-8 |

| | | | | |
|----|--|------|--|-----------|
| P | | 1 | | 7723-14-0 |
| Ti | | 0.07 | | 7440-32-6 |
| Li | | 0.87 | | 7439-93-2 |

CC 76-1 (Electric Phenomena)
 Section cross-reference(s): 52
 IT Battery electrolytes
 Dopants
 Ionic conductivity
 Sputtering
 (ionic conductivity of sputtered titanium-doped lithium phosphorous oxynitride films for lithium ion batteries)
 IT 205496-30-6P, Lithium nitrate oxide phosphide (Li0.55(NO₃)_{0.1}300.73P)
 205496-31-7P, Lithium titanium nitrate oxide phosphide (Li0.87Ti0.07(NO₃)_{0.1}800.6P)
 (ionic conductivity of sputtered titanium-doped lithium phosphorous oxynitride films for lithium ion batteries)

L20 ANSWER 33 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1998:28232 HCAPLUS Full-text
 DOCUMENT NUMBER: 128:92074
 ORIGINAL REFERENCE NO.: 128:17933a,17936a
 TITLE: Glass-ceramics having high lithium ion conductivity
 INVENTOR(S): Fu, Jie
 PATENT ASSIGNEE(S): Kabushiki Kaisha Ohara, Japan
 SOURCE: U.S., 6 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 3
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------------|------------|
| US 5702995 | A | 19971230 | US 1996-741704 <-- | 19961031 |
| JP 09142874 | A | 19970603 | JP 1995-320971 <-- | 19951115 |
| JP 3126306 | B2 | 20010122 | | |
| JP 10097811 | A | 19980414 | JP 1997-38303 <-- | 19970206 |
| JP 3012211 | B2 | 20000221 | | |
| EP 857699 | A2 | 19980812 | EP 1997-110106 <-- | 19970620 |
| EP 857699 | A3 | 19980916 | | |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI | | | | |
| EP 1028094 | A2 | 20000816 | EP 2000-110476 <-- | 19970620 |
| EP 1028094 | A3 | 20000920 | | |
| EP 1028094 | B1 | 20030521 | | |
| R: DE, FR, GB | | | | |
| JP 2000026135 | A | 20000125 | JP 1999-149686 <-- | 19990528 |
| JP 4090148 | B2 | 20080528 | | |
| US 20030205467 | A1 | 20031106 | US 2003-462450 <-- | 20030616 |
| US 7211532 | B2 | 20070501 | | |
| PRIORITY APPLN. INFO.: | | | JP 1995-320971 | A 19951115 |

| | | |
|-----|----------------|-------------|
| <-- | JP 1996-115694 | A 19960412 |
| <-- | JP 1997-38303 | A 19970206 |
| <-- | JP 1996-48379 | A 19960209 |
| <-- | US 1996-741704 | A2 19961031 |
| <-- | EP 1997-110106 | A3 19970620 |
| <-- | US 1997-923233 | B1 19970904 |
| <-- | US 2000-614948 | A1 20000712 |
| <-- | | |

ED Entered STN: 17 Jan 1998

AB Glass-ceramics having a high-lithium ion conductivity comprise P2O5 38-40, TiO2 25-45, M2O3 (where M is Al or Ga) 5-15, and Li2O 10-20 mol.% and contain Li_{1+x}(Al,Ga)_xTi_{2-x}(PO₄)₃ (where X is 0-0.8) as a main crystal phases. The glass-ceramics having a high-lithium ion conductivity also comprise P2O5 26-40, SiO2 0.5-12, TiO2 30-45, M2O3 (where M is Al or Ga) 5-10, and Li2O 10-18 mol.% and contain Li_{1+x+y}MxTi_{2-x}Si_yP_{3-y}O₁₂ (where 0<X≤0.4 and 0<Y≤0.6) as a main crystal phase.

IT 201010-46-0P 201010-47-1P

(crystal phase; glass-ceramics having high lithium ion conductivity)

RN 201010-46-0 HCAPLUS

CN Aluminum gallium lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ga | x | 7440-55-3 |
| Ti | x | 7440-32-6 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

RN 201010-47-1 HCAPLUS

CN Aluminum gallium lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ga | x | 7440-55-3 |
| Ti | x | 7440-32-6 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |

IC ICM C03C010-02

ICS C03C004-14

INCL 501010000

CC 57-2 (Ceramics)

Section cross-reference(s): 76

ST lithium ion cond high glass ceramic; aluminum lithium gallium phosphorus titanium oxide; solid electrolyte lithium ion

cond
 IT 201010-46-0P 201010-47-1P 201010-48-2P
 201010-49-3P
 (crystal phase; glass-ceramics having high lithium ion conductivity)

L20 ANSWER 34 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1997:762551 HCPLUS Full-text
 DOCUMENT NUMBER: 128:66727
 ORIGINAL REFERENCE NO.: 128:12959a,12962a
 TITLE: Mass-spectrometric study of neutral and ionic vapor components over Li₄TiP₂₀₉ and Na₄TiP₂₀₉ solid electrolytes
 AUTHOR(S): Pogrebnoi, A. M.; Kudish, L. S.; Krasnov, K. S.
 CORPORATE SOURCE: Ivanov. Gos. Khim.- Tekh. Akad., Ivanovo, Russia
 SOURCE: Zhurnal Fizicheskoi Khimii (1997),
 71(2), 210-215
 CODEN: ZFKHA9; ISSN: 0044-4537
 PUBLISHER: MAIK Nauka
 DOCUMENT TYPE: Journal
 LANGUAGE: Russian
 ED Entered STN: 08 Dec 1997

AB The basic neutral components are: LiPO₃, LiPO₂, PO, O₂, P, Pn (n = 2-4); the ionic components are predominantly alkali-metal pos. ions. The ion work functions (eV) were determined using the temperature dependence of the ionic currents: (1) for Li₄TiP₂₀₉ - 2.9±0.1 (Li⁺); 2.8±0.1 (Na⁺); 2.8±0.2 (K⁺); 2.5±0.2 (Rb⁺); 2.6±0.2 (Cs⁺); for Na₄TiP₂₀₉ - 2.1±0.1 (Na⁺); 2.2±0.1 (K⁺); 8.8±0.9 (OH⁻); 7.5±0.5 (PO₂₁₋); 6.5±2 (PO₃⁻). The partial pressures of O₂ and water were calculated using equilibrium consts. of the ion-mol. equilibrium: 2PO₃⁻ = 2PO₂⁻ + O₂ and 2OH⁻ = O₂ + H₂O.

IT 200341-13-5, Lithium titanium (diphosphate) oxide
 (Li₄Ti(P₂₀₇)O₂)
 (neutral and ionic vapor components over solid Li₄TiP₂₀₉ and Na₄TiP₂₀₉, ion work functions, and partial pressures)

RN 200341-13-5 HCPLUS

CN Lithium titanium (diphosphate) oxide (Li₄Ti(P₂₀₇)O₂) (CA INDEX NAME)

| Component | Ratio | Component | |
|----------------|-------|-----------|-----------------|
| | | | Registry Number |
| O | 2 | | 17778-80-2 |
| P ₂ | 1 | | 14000-31-8 |
| Ti | 1 | | 7440-32-6 |
| Li | 4 | | 7439-93-2 |

CC 65-6 (General Physical Chemistry)
 Section cross-reference(s): 68, 69, 76
 IT 7732-18-5, Water, properties 7782-44-7, Oxygen, properties
 14280-30-9, Hydroxide, properties 15389-19-2, Metaphosphate (PO₃₁₋)
 17341-24-1, Lithium(l+), properties 17341-25-2, Sodium(l+),
 properties 18459-37-5, Cesium(l+), properties 20499-58-5,
 Metaphosphate 22537-38-8, Rubidium(l+), properties 162355-30-8,
 Sodium titanium (diphosphate) oxide (Na₄Ti(P₂₀₇)O₂)
 200341-13-5, Lithium titanium (diphosphate) oxide
 (Li₄Ti(P₂₀₇)O₂)
 (neutral and ionic vapor components over solid Li₄TiP₂₀₉ and
 Na₄TiP₂₀₉, ion work functions, and partial pressures)

L20 ANSWER 35 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1997:609764 HCPLUS Full-text
 DOCUMENT NUMBER: 127:250694

ORIGINAL REFERENCE NO.: 127:48951a,48954a
 TITLE: Nonaqueous electrolyte lithium secondary battery and its lithium-nickel mixed oxide cathode for suppression of self discharge
 INVENTOR(S): Yamaura, Kiyoshi
 PATENT ASSIGNEE(S): Sony Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|----------------------|----------|
| JP 09231975 | A | 19970905 | JP 1996-56914 --> | 19960220 |
| PRIORITY APPLN. INFO.: | | | JP 1996-56914 --> | 19960220 |

ED Entered STN: 24 Sep 1997
 AB The cathode is made of a Li-Ni mixed oxide containing P [0.003< (P/Li) <0.1, atomic ratio]. The battery using the cathode suppresses self discharge and has small capacity loss even in storage at high temperature
 IT 195881-00-6P, Lithium nickel phosphorus oxide
 (cathode; nonaq. electrolyte lithium secondary battery
 lithium-nickel mixed oxide cathode for suppressed self discharge at
 high temperature)
 RN 195881-00-6 HCPLUS
 CN Lithium nickel phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Ni | x | 7440-02-0 |
| Li | x | 7439-93-2 |

IC ICM H01M004-58
 ICS H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST nonaq electrolyte lithium battery cathode; lithium nickel phosphorus oxide battery cathode
 IT Battery cathodes
 (nonaq. electrolyte lithium secondary battery
 lithium-nickel mixed oxide cathode for suppressed self discharge at
 high temperature)
 IT 39300-70-4P, Lithium nickel oxide
 (cathode, phosphorus-containing; nonaq. electrolyte lithium
 secondary battery lithium-nickel mixed oxide cathode for suppressed
 self discharge at high temperature)
 IT 195881-00-6P, Lithium nickel phosphorus oxide
 (cathode; nonaq. electrolyte lithium secondary battery
 lithium-nickel mixed oxide cathode for suppressed self discharge at
 high temperature)
 IT 7723-14-0, Phosphorus, uses
 (lithium nickel oxide containing; nonaq. electrolyte lithium
 secondary battery lithium-nickel mixed oxide cathode for suppressed
 self discharge at high temperature)
 IT 1310-65-2, Lithium hydroxide 1313-99-1, Nickel oxide, processes

10377-52-3, Lithium phosphate
 (raw material for mixed oxide; nonaq. electrolyte lithium
 secondary battery lithium-nickel mixed oxide cathode for suppressed
 self discharge at high temperature)

L20 ANSWER 36 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1994:546570 HCPLUS Full-text
 DOCUMENT NUMBER: 121:146570
 ORIGINAL REFERENCE NO.: 121:26257a,26260a
 TITLE: Ceramic solid electrolyte obtained by
 sintering
 INVENTOR(S): Nakayama, Susumu; Kuroshima, Hiroshi
 PATENT ASSIGNEE(S): Shinagawa Refractories Co, Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-----------------|
| JP 06080462 | A | 19940322 | JP 1992-231856 | 19920831 <-- |
| PRIORITY APPLN. INFO.: | | | JP 1992-231856 | 19920831 <-- |

ED Entered STN: 17 Sep 1994

AB The solid electrolyte is obtained by mixing a ceramic electrolyte with high elec. conductivity with ≤40 weight% ionic conductor electrolyte containing the same ions as those of the ceramic electrolyte and more glass components and sintering. The electrolyte obtained by sintering at 900-1100° showed high elec. conductivity

IT 157322-04-8P 157322-07-1P 157322-08-2P,
 Indium lithium phosphorus titanium oxide 157322-09-3P
 157322-10-6P 157322-11-7P 157322-12-8P

(ceramics, solid electrolyte, preparation of, by low-temperature
 sintering, with high elec. conductivity)

RN 157322-04-8 HCPLUS

CN Indium lithium phosphorus samarium silicon titanium oxide (CA INDEX
 NAME)

| Component | Ratio | Component | |
|-----------|-------|------------|-----------------|
| | | | Registry Number |
| O | x | 17778-80-2 | |
| P | x | 7723-14-0 | |
| In | x | 7440-74-6 | |
| Ti | x | 7440-32-6 | |
| Si | x | 7440-21-3 | |
| Sm | x | 7440-19-9 | |
| Li | x | 7439-93-2 | |

RN 157322-07-1 HCPLUS

CN Aluminum indium lithium phosphorus silicon titanium oxide (CA INDEX
 NAME)

| Component | Ratio | Component | |
|-----------|-------|------------|-----------------|
| | | | Registry Number |
| O | x | 17778-80-2 | |

10/551,935

| | | | | |
|----|--|---|--|-----------|
| P | | x | | 7723-14-0 |
| In | | x | | 7440-74-6 |
| Ti | | x | | 7440-32-6 |
| Si | | x | | 7440-21-3 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 157322-08-2 HCPLUS
CN Indium lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| In | | x | | 7440-74-6 |
| Ti | | x | | 7440-32-6 |
| Li | | x | | 7439-93-2 |

RN 157322-09-3 HCPLUS
CN Aluminum indium lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| In | | x | | 7440-74-6 |
| Ti | | x | | 7440-32-6 |
| Li | | x | | 7439-93-2 |
| Al | | x | | 7429-90-5 |

RN 157322-10-6 HCPLUS
CN Boron indium lithium phosphorus titanium oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| In | | x | | 7440-74-6 |
| B | | x | | 7440-42-8 |
| Ti | | x | | 7440-32-6 |
| Li | | x | | 7439-93-2 |

RN 157322-11-7 HCPLUS
CN Indium lithium phosphorus silicon titanium oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| In | | x | | 7440-74-6 |
| Ti | | x | | 7440-32-6 |
| Si | | x | | 7440-21-3 |
| Li | | x | | 7439-93-2 |

RN 157322-12-8 HCPLUS
CN Aluminum lithium phosphorus silicon zirconium oxide (CA INDEX NAME)

| Component | Ratio | Component Registry Number |
|-----------|---|------------------------------|
| O | x | 17778-80-2 |
| P | x | 7723-14-0 |
| Zr | x | 7440-67-7 |
| Si | x | 7440-21-3 |
| Li | x | 7439-93-2 |
| Al | x | 7429-90-5 |
| IC | ICM C04B035-00 | |
| | ICS H01B001-06 | |
| CC | 76-2 (Electric Phenomena) | |
| | Section cross-reference(s): 57 | |
| ST | ceramic oxide electrolyte solid sintering | |
| IT | Electric conductors, ceramic (oxide, manufacture of, by low-temperature sintering, with high elec. conductivity, for solid electrolyte) | |
| IT | 6834-92-0 7601-54-9, Sodium phosphate 10102-24-6, Lithium silicon oxide (Li ₂ SiO ₃) 10377-52-3, Lithium phosphate 12003-51-9 12003-67-7, Lithium aluminum oxide (LiAlO ₂) 13465-88-8 13465-97-9, Silver phosphorus oxide (Ag ₄ F ₂₀) 13497-94-4, Silver vanadium oxide (AgVO ₃) 16625-98-2 19497-94-0 22307-58-0 28132-50-5, Sodium zirconium phosphate [Na ₂ Zr(PO ₄) ₂] 34370-43-9 58572-20-6, Sodium zirconium phosphate silicate (Na ₃ Zr ₂ (PO ₄)(SiO ₄) ₂) 76572-26-4 129039-87-8, Silver zirconium phosphate silicate (Ag ₃ Zr ₂ (PO ₄)(SiO ₄) ₂) 150232-17-0, Indium lithium titanium phosphate (In _{0.4} Li _{1.4} Ti _{1.6} (PO ₄) ₃) 157281-79-3, Lithium samarium oxide silicate (Li ₄ Sm ₂ (SiO ₄) ₂) 157281-80-6, Gadolinium sodium oxide silicate (Gd ₂ Na ₄₀ (SiO ₄) ₂) (ceramics, low-temperature sintering of, solid electrolyte from) | |
| IT | 157322-04-8P 157322-05-9P 157322-06-0P 157322-07-1P 157322-08-2P, Indium lithium phosphorus titanium oxide 157322-09-3P 157322-10-6P 157322-11-7P 157322-12-8P 157322-13-9P 157322-14-0P 157322-15-1P 157322-16-2P 157322-17-3P (ceramics, solid electrolyte, preparation of, by low-temperature sintering, with high elec. conductivity) | |

L20 ANSWER 37 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1994:168922 HCPLUS Full-text
 DOCUMENT NUMBER: 120:168922
 ORIGINAL REFERENCE NO.: 120:29731a,29734a
 TITLE: Lithium batteries having high-capacity cathodes
 INVENTOR(S): Kamauchi, Masaharu
 PATENT ASSIGNEE(S): Mitsubishi Cable Industries, Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------------|----------|
| JP 05325961 | A | 19931210 | JP 1992-124595 <-- | 19920518 |

PRIORITY APPLN. INFO.: JP 1992-124595 19920518

<--

ED Entered STN: 02 Apr 1994

AB In the batteries having Li or Li alloy anodes, cathodes, and electrolytes, cathode active masses comprise composite oxides at least containing Mn and P. The batteries have high energy d. giving high electromotive force and discharge voltage.

IT 138758-08-4, Lithium manganese oxide phosphate
(cathodes containing, in lithium batteries, for high energy d.)

RN 138758-08-4 HCPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|--|
| | | Registry Number | |
| O | x | 17778-80-2 | |
| P | x | 7723-14-0 | |
| Mn | x | 7439-96-5 | |
| Li | x | 7439-93-2 | |

IC ICM H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 138758-08-4, Lithium manganese oxide phosphate 153593-60-3,
Manganese phosphorus oxide ((Mn_xO)_y)
(cathodes containing, in lithium batteries, for high energy d.)

L20 ANSWER 38 OF 40 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1994:139214 HCPLUS Full-text

DOCUMENT NUMBER: 120:139214

ORIGINAL REFERENCE NO.: 120:24455a,24458a

TITLE: Nonaqueous-electrolyte secondary
batteries with improved anodesINVENTOR(S): Yamamoto, Jiji; Furukawa, Sanehiro; Nishio, Koji;
Noma, Toshuki; Kurokawa, Hiroshi; Uehara, Mayumi

PATENT ASSIGNEE(S): Sanyo Electric Co, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| JP 05283077 | A | 19931029 | JP 1992-108908 | 19920331 |
| JP 3152497 | B2 | 20010403 | | <-- |
| PRIORITY APPLN. INFO.: | | | JP 1992-108908 | 19920331 |

ED Entered STN: 19 Mar 1994

AB The batteries use Li or Li-intercalatable anodes, and cathodes of LixMyMnO_z (M = B, Si, P, Ga, Ge, As, Se, In, Sn, Sb, Te, Pb, Po, and/or At; x, y, z = pos. number; preferably 0.04 ≤ y ≤ 1.0). Preferably, M is B. Optionally, the cathodes contain Li₂B4O₇. The batteries prevent internal resistance.IT 138758-08-4, Lithium manganese oxide phosphate
(cathodes, for nonaq.-electrolyte batteries)

RN 138758-08-4 HCPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | Ratio | Component | |
|-----------|-------|-----------------|--|
| | | Registry Number | |
| | | | |

| | | | | |
|----|--|---|--|------------|
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Mn | | x | | 7439-96-5 |
| Li | | x | | 7439-93-2 |

IC ICM H01M004-58
 ICS H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 138758-08-4, Lithium manganese oxide phosphate 153325-75-2,
 Lead lithium manganese oxide 153327-00-5, Gallium lithium manganese
 oxide 153327-01-6, Germanium lithium manganese oxide 153327-02-7,
 Lithium manganese borate oxide 153327-03-8 153327-04-9, Indium
 lithium manganese oxide 153327-05-0, Lithium manganese tin oxide
 153327-06-1, Antimony lithium manganese oxide 153327-07-2, Lithium
 manganese polonium oxide 153385-76-3, Lithium manganese arsenate
 oxide 153385-77-4 153385-78-5, Lithium magnesium astatide oxide
 153385-79-6, Lithium manganese oxide selenate
 (cathodes, for nonaq.-electrolyte batteries)

L20 ANSWER 39 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1992:63493 HCAPLUS Full-text

DOCUMENT NUMBER: 116:63493

ORIGINAL REFERENCE NO.: 116:10891a,10894a

TITLE: Cathode-active mass for secondary lithium
 batteries and their preparation

INVENTOR(S): Yamaura, Junichi; Nishikawa, Yukio; Morita,
 Teruyoshi; Eda, Nobuo; Koshina, Hide; Okuno,
 Hiromi; Ozaki, Yoshiyuki

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|-----------------|
| JP 03119658 | A | 19910522 | JP 1989-259209 | 19891003 --> |
| JP 3102005 | B2 | 20001023 | JP 1989-259209 | 19891003 --> |

PRIORITY APPLN. INFO.: Entered STN: 21 Feb 1992

AB Electrolytic MnO₂, Li₃PO₄ or P₂O₅, and Li₃PO₄ or LiNO₃ are mixed at Mn:P:Li
 atomic ratio = 1.00:0.02-0.10:0.10-0.40 and fired at 350-480° in air to give
 the cathode-active mass. Li batteries uses these active mass have high energy
 d., good storage stability and low-temperature performance.

IT 138758-08-4P, Lithium manganese oxide phosphate
 (cathodes, preparation of, for secondary lithium batteries)

RN 138758-08-4 HCAPLUS

CN Lithium manganese phosphorus oxide (CA INDEX NAME)

| Component | | Ratio | | Component |
|-----------|--|-------|--|-----------------|
| | | | | Registry Number |
| O | | x | | 17778-80-2 |
| P | | x | | 7723-14-0 |
| Mn | | x | | 7439-96-5 |

Li | x | 7439-93-2

IC ICM H01M004-50
ICS H01M010-40CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 133758-08-4P, Lithium manganese oxide phosphate
(cathodes, preparation of, for secondary lithium batteries)

L20 ANSWER 40 OF 40 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1991:176333 HCAPLUS Full-text
 DOCUMENT NUMBER: 114:176333
 ORIGINAL REFERENCE NO.: 114:29559a,29562a
 TITLE: Solid electrolyte and its preparation
 INVENTOR(S): Yamamura, Koji; Takada, Kazunori; Taniguchi, Noboru; Kondo, Shigeo
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|-----------------|
| JP 02225310 | A | 19900907 | JP 1989-43759 | 19890223 <-- |
| PRIORITY APPLN. INFO.: | | | JP 1989-43759 | 19890223 <-- |

ED Entered STN: 03 May 1991
 AB A Li ion conductive solid electrolyte is $\text{Li}_{1+x}\text{MxTi}_{2-x}(\text{PO}_4)_3$ ($\text{M} = \text{B}, \text{Al}, \text{Ga}, \text{In}, \text{Ti}, \text{Sc}, \text{Y}, \text{La}, \text{Ce}, \text{Pr}$) and optionally a metal oxide is added to the phosphate and its preparation involves making the phosphate amorphous and annealing the resulting phosphate. The solid electrolyte is prepared by adding H_3PO_4 to ethanol containing salts of Li, Ti, and M, neutralizing the solution by alkali to give a mainly Li_3PO_4 and $\text{Ti}_3(\text{PO}_4)_4$ mixture, and sintering the mixture. The electrolyte is useful for solid electrolyte batteries, elec. double layer capacitors, electrochromic display, etc. The ion conductivity of the phosphate compound depends on its grain size and grain size uniformity.

IT 133139-17-0
(solid electrolyte of, lithium ion conductive, for battery and capacitor and display device)

RN 133139-17-0 HCAPLUS

CN Lithium titanium borate metaphosphate oxide
($\text{Li}_{1.3}\text{Ti}_{1.7}(\text{BO}_3)_0.3(\text{PO}_3)_3\text{O}_2.1$) (CA INDEX NAME)

| Component | Ratio | Component |
|-----------|-------|-----------------|
| | | Registry Number |
| O | 2.1 | 17778-80-2 |
| O3P | 3 | 15389-19-2 |
| BO3 | 0.3 | 14213-97-9 |
| Ti | 1.7 | 7440-32-6 |
| Li | 1.3 | 7439-93-2 |

IC ICM C01B025-45
 ICS C01B035-14; H01B001-06; H01M006-18; H01M010-36
 CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 52, 74

- ST lithium titanium phosphate ion conductive; battery capacitor display solid electrolyte
- IT Batteries, primary
(lithium ion conductive solid electrolyte for, phosphate compds. as)
- IT Electric capacitors
(double-layer, lithium ion conductive solid electrolyte for, phosphate compds. as)
- IT Optical imaging devices
(electrochromic, lithium ion conductive solid electrolyte for, phosphate compds. as)
- IT 120479-61-0, Aluminum lithium titanium phosphate [Al0.3Li1.3Ti1.7(PO4)3] 127689-78-5, Lanthanum lithium titanium phosphate [La0.3Li1.3Ti1.7(PO4)3] 127887-18-7, Lithium scandium titanium phosphate [Li1.3Sc0.3Ti1.7(PO4)3] 131313-56-9, Lithium titanium yttrium phosphate (Li1.3Ti1.7Y0.3(PO4)3) 131313-74-1, Gallium lithium titanium phosphate (Ga0.3Li1.3Ti1.7(PO4)3)
131313-76-3, Indium lithium titanium phosphate (In0.3Li1.3Ti1.7(PO4)3)
133138-74-6, Cerium lithium titanium phosphate (Ce0.3Li1.3Ti1.7(PO4)3)
133139-17-0 133174-38-6, Lithium thallium titanium phosphate (Li1.3Tl0.3Ti1.7(PO4)3) 133174-39-7, Lithium praseodymium titanium phosphate (Li1.3Pr0.3Ti1.7(PO4)3)
(solid electrolyte of, lithium ion conductive, for battery and capacitor and display device)

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(FILE 'HOME' ENTERED AT 08:04:20 ON 17 SEP 2008)

FILE 'HCAPLUS' ENTERED AT 08:04:31 ON 17 SEP 2008
 L1 1 SEA ABB=ON PLU=ON US20060216611/PN
 SEL RN

FILE 'REGISTRY' ENTERED AT 08:05:39 ON 17 SEP 2008
 L2 54 SEA ABB=ON PLU=ON (221273-01-4/B1 OR 7440-21-3/B1 OR
 7440-57-5/B1 OR 12190-79-3/B1 OR 782495-23-2/B1 OR
 782495-24-3/B1 OR 782495-25-4/B1 OR 782495-26-5/B1 OR
 782495-27-6/B1 OR 782495-28-7/B1 OR 782495-29-8/B1 OR
 782495-30-1/B1 OR 782495-31-2/B1 OR 782495-32-3/B1 OR
 782495-33-4/B1 OR 782495-34-5/B1 OR 782495-35-6/B1 OR
 782495-36-7/B1 OR 782495-37-8/B1 OR 782495-38-9/B1 OR
 782495-39-0/B1 OR 782495-40-3/B1 OR 782495-41-4/B1 OR
 782495-42-5/B1 OR 782495-43-6/B1 OR 782495-44-7/B1 OR
 782495-45-8/B1 OR 782495-46-9/B1 OR 782495-47-0/B1 OR
 782495-48-1/B1 OR 782495-49-2/B1 OR 782495-50-5/B1 OR
 782495-51-6/B1 OR 782495-52-7/B1 OR 782495-53-8/B1 OR
 782495-54-9/B1 OR 782495-55-0/B1 OR 782495-56-1/B1 OR
 782495-57-2/B1 OR 782495-58-3/B1 OR 782495-59-4/B1 OR
 782495-60-7/B1 OR 782495-61-8/B1 OR 782495-62-9/B1 OR
 782495-63-0/B1 OR 782495-64-1/B1 OR 782495-65-2/B1 OR
 782495-66-3/B1 OR 782495-67-4/B1 OR 782495-69-6/B1 OR
 782495-70-9/B1 OR 782495-72-1/B1 OR 782495-74-3/B1 OR
 782495-76-5/B1)
 L3 50 SEA ABB=ON PLU=ON L2 AND P/ELS
 L4 24 SEA ABB=ON PLU=ON L3 NOT O4P

FILE 'HCAPLUS' ENTERED AT 08:06:46 ON 17 SEP 2008
 L5 4 SEA ABB=ON PLU=ON L4

FILE 'REGISTRY' ENTERED AT 08:07:37 ON 17 SEP 2008
 L6 3811 SEA ABB=ON PLU=ON ((I(L)P(L)O(L)(TI OR V OR CR OR MN OR
 FE OR CO OR NI OR CU OR ZR OR NB OR MO OR RU OR AG OR TA
 OR W OR PT OR AU))/ELS)
 L7 1802 SEA ABB=ON PLU=ON L6 NOT O4P
 L8 23 SEA ABB=ON PLU=ON L7 AND L2
 L9 1 SEA ABB=ON PLU=ON L4 NOT L8
 L10 291 SEA ABB=ON PLU=ON L7 AND TIS/CI

FILE 'HCAPLUS' ENTERED AT 08:09:28 ON 17 SEP 2008
 L11 165 SEA ABB=ON PLU=ON L10
 L12 54 SEA ABB=ON PLU=ON L11 AND ?ELECTROLYT?

FILE 'REGISTRY' ENTERED AT 08:26:56 ON 17 SEP 2008
 L13 53 SEA ABB=ON PLU=ON L10 AND 2-7/LI
 L14 46 SEA ABB=ON PLU=ON L13 AND 3.5-8/O
 L15 46 SEA ABB=ON PLU=ON L14 AND 0.01-1/M
 L16 245 SEA ABB=ON PLU=ON L10 NOT L15

FILE 'HCAPLUS' ENTERED AT 08:31:40 ON 17 SEP 2008
 L17 153 SEA ABB=ON PLU=ON L16
 L18 49 SEA ABB=ON PLU=ON L17 AND ?ELECTROLYT?
 L19 54 SEA ABB=ON PLU=ON L12 OR L18
 L20 40 SEA ABB=ON PLU=ON L19 AND (1840-2003)/PRY,AY,PY

